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Job Performance Report

Project F-71-R-12

REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS

Job No. 3(GC)-a. Region 3 (Boise) Mountain Lakes Investigations
Job No. 3(GC)-b[1]. Region 3 (Boise) Lowland Lakes and Reservoir Investigations--Paddock Reservoir Creel Survey
Job No. 3(GC)-b[2]. Region 3 (Boise) Lowland Lakes and Reservoir Investigations
Job No. 3(GC)-c. Region 3 (Boise) Rivers and Streams Investigations
'Job No. 3(GC)-d. Region 3 (Boise) Technical Guidance

By

Brent Mabbott, Regional Fishery Biologist
Terry Holubetz, Regional Fishery Manager

March 1989

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JOB PERFORMANCE REPORT

State of: Idaho

Name: REGIONAL FISHERY MANAGEMENT INVESTIGATIONS

Project No.: F-71-R-12

Title: Region 3 (Boise) Mountain Lakes Investigations

Job No.: 3(GC)-a

Period Covered: July 1, 1987 to June 30, 1988

ABSTRACT

Idaho Department of Fish and Game personnel collected information from eight lakes in the Middle Fork Boise River drainage, 15 lakes in the South Fork Payette River drainage, and one lake from the North Fork Boise and Middle Fork Salmon River drainages. From each, we recorded approximate lake size, location, presence of spawning gravels, camping use, and species and length of fish observed.

Authors:

Brent Mabbott
Regional Fishery Biologist

Terry Holubetz
Regional Fishery Manager

OBJECTIVES

1. Assess lake habitat, fish populations, and fishery status in Region 3 mountain lakes to evaluate current management or recommend new management.

2. To determine locations for grayling stocking in select mountain lakes in the Middle and North Fork Boise, South Fork Payette, and Middle Fork Salmon River drainages.

TECHNIQUES USED

Idaho Department personnel visited 31 mountain lakes. At each lake, we obtained fish species data by hook and line angling, angler interviews, and direct observation. Human use and spawning potential of inlets and outlets of each lake were noted by direct observation.

FINDINGS

Of the 31 lakes investigated (Table 1), the Idaho Department of Fish and Game stocks 15 with cutthroat (Table 2). Ten lakes are currently barren, and six lakes contain self-sustaining populations of cutthroat and brook trout. Two lakes should be removed from the stocking schedule. Hidden Lake has a self-sustaining population of brook trout and Lake Creek has fish in poor body condition with apparent self-sustaining populations of cutthroat. Six of the 10 Lake Creek drainage lakes are barren. All these lakes could support cutthroat trout and several may be used in stocking grayling.

Middle Fork of the Boise River

The largest of the Warren Lakes is next to the main trail and appears to be approximately two acres in size. Physical observations of the lake suggest that we could begin introductions of cutthroat and monitor this introduction prior to placing the lake in the normal three-year rotation of stocking.

Lake Creek appears to have a self-sustaining population of both cutthroat and rainbow trout. Cutthroat fry were observed in the outlet of the lake indicating a successful spawn. The larger fish sampled in Lake Creek in 1987 generally showed a poor body condition. We should suspend stocking Lake Creek and monitor this lake before further stocking.

Table 1. Summary of locations and sizes of mountain lakes studied in 1987.

Lake	T	R	S	Size ha (acres)	Drainage[a]
Warren Lakes (4)	6N	10E	5	0.8-2.0 (1-5)	West Warrior Cr.(MFB)
Lake Creek (Steel Mtn.)	5N	10E	17	-	Lake Cr. (MFB)
Lodgepole	6N	10E	5	0.8 (2)	N. Fk. Boise
L8208	7N	12E	17	10.1 (25)	Queen's (MFB)
Plummer	7N	12E	8	14.2 (35)	Queen's (MFB)
Ingeborg	7N	12E	10	16.2 (40)	M. Fk. Boise
S. Spandle	7N	12E	10	1.6 (4)	M. Fk. Boise
Spangle L.	7N	12E	11	16.2 (40)	M. Fk. Boise
Little Spangle	7N	12E	11	8.1 (20)	M. Fk. Boise
Everly	7N	12E	8	16.2 (40)	Benedict Cr. (SFP)
Benedict	7N	12E	4	2.0 (5)	Benedict Cr. (SFP)
Rock Slide (Rob Jackson)	7N	12E	10	2.0 (5)	Benedict Cr. (SFP)
Three Island	7N	12E	9	2.8 (7)	Benedict Cr. (SFP)
Unnamed N. of Three Island	7N	12E	9	2.0 (5)	Benedict Cr. (SFP)
Ardeth	7N	12E	1-2	60.8 (150)	Ten Lake Cr. (SFP)
Unnamed W. of Ardeth	7N	12E	2	2.0 (5)	Ten Lake Cr. (SFP)
Five unnamed lakes S. of Ardeth	7N	12E	1-12	0.4-2.0 (1-5)	Ten Lake Cr. (SFP)
Vernon	7N	13E	6	8.1 (20)	S. Fk. Payette
Edna	7N	13E	6	16.2 (40)	S. Fk. Payette
Virginia	8N	13E	31	6.1 (15)	S. Fk. Payette
Hidden	8N	12E	24-5	10.1 (25)	S. Fk. Payette
Red Mtn. No. 2	11N	9E	28	2.8 (7)	Eight-Mile Cr. (SFP)
Eight-Mile	11N	9E	33	2.0 (5)	Eight-Mile Cr. (SFP)
Elk	8N	12E	16 & 21	8.1 (20)	S. Fk. Payette
Lake Creek	11N	9E	20	4.9 (12)	Bear Valley Cr. (MFS)

[a]MFB = Middle Fork Boise
SFP = South Fork Payette
MFS = Middle Fork Salmon

Table 2. Summary of data collected from mountain lakes in 1987.

Lake	Fish species (mm)	Use	Miles hiked[b]	Catch/hr 1985/1987	Spawning gravel	Last stocked	Observations
Warren Lakes (4)	NONE	L	3	-	NONE	-	Next to main trail; began stocking large lake
Lake Creek (Steel Mtn.)	Ct (fry-350)	L	6	-/3.9	Outlet	1982	Fish in poor condition; suspend stocking; 3-hr walk, no trail last 2 miles
Lodgepole	Ct (300-350) Rb (350)	L	5	-/2.7	Inlet	1985	Steep climb down from main trail
L8208	Ct (40-350)	L	15	-/10	Outlet	S	Steep trail in; many springs around lake; good aquatic insects; good fish cover
Plummer	Ct (250-300)	M	14	-/0.8	In-outlet (poor)	1984	No fry observed
Ingeborg	Ct (200-400)	M	21.5	0.6/3.0	NONE	1984	Down 15 ft. from normal; several camping areas; good fishing
S. Spangle	Ct (150)	L-M	22.5	-/10	NONE	S	Good fishing; down 6-8 ft.
Spangle	Bt	M-H	23	4/0	Inlet	S	Poor fishing; poor spawning area
Little Spangle	Bt (125-200)	M-H	23	0.6/0.1	Inlet	S	Poor fishing; poor spawning area

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Table 2. Continued.

Lake	Fish species (mm)	Use	Miles hiked[b]	Catch/hr 1985/1987	Spawning gravel	Last stocked	Observations
Everly	Ct (200-300)	M	14.5	4/0	NONE	1984	Fish in good condition; several camping areas
Benedict	Ct (100-270)	M	18.5	-/4	NONE	1985	Fish in good condition; camping area
Rock Slide (R.J.)	Ct (175-200)	L-M	19.5	5.5/0.5	NONE	1985	Few fish; 2 camping areas; fish in good condition
Three Island	Ct (175-250	L	20.5	-/4	Inlet	1984	No fry observed; water level down
Unnamed N. of Three Island	Ct (350-400)	L	20.5	-	NONE	S	Possibility for future stocking
Ardeth	Ct (350-400)[c] Bt (300)	H	26	1.0/0.2	Outlet (poor)	1984	Heavy usage; poor fishing; several horse camping numerous camping areas
Unnamed W. of Ardeth	NONE	L	26	-	NONE	-	Some visitors; appears deep enough to support fish; possible grayling stocking
Five unnames lakes S. of Ardeth	NONE	L	26	-	NONE	-	All lakes could support possible graylng stocking
Vernon	Ct (250)	L-M	28	-/0	NONE	1984	Several camping areas; poor fishing

Table 2. Continued.

Lake	Fish species (mm)	Use	Miles hiked[b]	Catch/hr 1985/1987	Spawning gravel	Last stocked	Observations
Edna	Ct (300-450)	M-H	29	-/2.5	NONE	1984	Heavy horse use; fair several camping areas
Virginia	Ct (100-300)	m	30	-/4.0	Outlet (20 m^2) (good)	1985	Good spawning gravel; 2 camping areas
Hidden	Bt (100-250)	L-M	33	-/0.8	In-outlet (poor)	1983	Two camping areas; fair fishing
Red Mtn. No. 2[a]	Ct (150-250)	M	3	-/2.0	NONE	1986	Three camping areas; fish in good condition
Eight-Mile No. 1	Ct (175)	M	2.5	-/10	NONE	Unknown	Numerous cutthroat; 2 camping areas
Lake Creek	Rb (300, 175, 40)	L	2	-/1.5	Yes	S	Fry observed; 1 camping area
Elk	Bt (50-300)	M-H	40	-/2.0	In-outlet	S	Fair fishing; lake is almost filled with sediment; several camping sites

(+) S = self-sustaining.

[a]See 1986 report.

[b]From wilderness boundary at Queens River.

[c]Report from another angler.

Both Little Spangle and Spangle lakes were extremely poor fishing during the visit in 1987. These lakes in the 1985 study (Reid 1986) were found to have large numbers of brook trout. The 1987 study did not find this result. Further observations will be required to determine if additional stocking would improve the angling effort.

South Fork of the Payette River

The Ten Lake Creek drainage has six lakes that currently have no populations of fish. One lake 1/2 mile south of Ardeth Lake appears to be suitable for fish. It is generally shallow but has areas of deep water that could overwinter fish. This lake would also offer some spawning areas at the mouths of several small inlet springs. There are also five lakes, 1/2 to 1 mile east of Ardeth, that are 800 feet in elevation above Ardeth. All appear to have sufficient depth for overwintering of fish, and each of these lakes offer the possibility of grayling introductions.

Ardeth Lake receives heavy pressure from backpackers. It is a large mountain lake that has numerous camping sites. Several of these sites are used regularly by campers on horseback. In 1985, this lake was reported to have good numbers of brook trout (Reid 1986). Observations in 1987 did not show the same results. Before removing Ardeth from the stocking schedule as suggested by Reid (1986), we should further observe the stocking and angling success.

Vernon and Edna lakes also receive heavy pressure. Each of these lakes should be stocked every two years with 1,000 cutthroat.

LITERATURE CITED

Reid, W. 1986. In publication.

JOB PERFORMANCE REPORT

State of: Idaho

Name: REGIONAL FISHERY MANAGEMENT INVESTIGATIONS

Project No.: F-71-R-12

Title: Region 3 (Boise) Lowland Lakes and Reservoirs Investigations--Paddock Reservoir Creel Survey

Job No.: 3(GC)-b[l]

Period Covered: July 1, 1987 to June 30, 1988

ABSTRACT

Most of the project activity was concentrated at Paddock Reservoir in 1987. From April 4 to September 18, 1987, anglers fishing Paddock Reservoir expended an estimated 57,153 hours to harvest 75,219 game fish. Crappie made up 951 of the total harvest. Anglers interviewed generally indicated a preference not to release largemouth bass less than 12 inches. A population estimate of largemouth bass was 8,674 fish, and these fish were each caught an estimated 3.6 times during the study.

Authors:

Brent Mabbott
Regional Fishery Biologist

Terry Holubetz
Regional Fishery Manager

OBJECTIVES

1. To determine angler harvest and success.
2. To determine population status of largemouth bass in Paddock Reservoir.

TECHNIQUES USED

From April 4 to September 18, 1987, a creel survey was conducted to estimate angler use and harvest at Paddock Reservoir (Figure 1). The study encompassed the entire reservoir of approximately 1,500 acres.

Using electrofishing equipment, we sampled the largemouth bass in Paddock Reservoir and used those samples to estimate the largemouth bass population. A pectoral fin was clipped for future identification. Lengths and weights were recorded on all fish captured. Two boats were used in this effort, one to capture and one to mark fish, to ensure rapid releasing of the fish being marked. A modified Schnabel method (Ricker 1975) was used to estimate the population of largemouth bass.

The creel survey was divided into six separate 28-day intervals. Within each 28-day interval, weekends and weekdays were treated separately. Holidays were included with weekend counts. From each 28-day interval, we randomly selected four weekdays and four weekend days to count. Average length of daylight (plus 1/2 hour for each twilight count) was calibrated for each day. Each day was divided into three or four equal time periods, depending upon length of daylight. Each time period was then subdivided into three equal time units. When a day was randomly selected for instantaneous angler counts, we also randomly selected the subtime units within each time period we would count. Thus, we made three or four angler counts each survey day. We randomly selected four weekend days and four weekdays to conduct angler interviews during each 28-day interval.

During each count, the census clerk would enumerate boats and anglers in boats, on the bank, and in float tubes. The clerk would also count the number of boat trailers to evaluate accuracy of number of boats counted. We estimated hours of use for weekends and weekdays separately. Expansion of mean anglers per count, times daylight hours, times weekend days or weekdays, respectively, will yield total use for each 28-day interval.

On count days when time allowed and on noncount days, the census clerk interviewed all anglers encountered to obtain angler harvest and angler preference information. The clerk asked each angler for hours fished, license type, angling method, terminal tackle used, fish in creel, and fish released. Anglers were also asked, when shown models of life-sized bass, which they preferred to catch and which they would release, without regard to current regulations (12-inch minimum). During

Figure 1. Paddock Reservoir.

April and until mid-May, anglers were shown four pictures of bass (10, 12, 15, and 17-inch) when asked the preceding questions. After mid-May, an additional eight-inch bass was included during questioning. Anglers were also questioned as to the fish species that they were seeking.

Techniques used for assessing population structure and condition are described under Job b[2].

FINDINGS

Between April 13 and April 22, the mark-and-recapture sampling effort established a population estimate of 8,674 (CI 6,012-13,058) largemouth bass in Paddock Reservoir (Figure 2). Length and weight data collected from 906 bass found only 34 bass (3.7%) greater than 12 inches or legal size (Figure 3), with a proportional stock density of 4. Relative weights were below the ideal (100) except in bass larger than 390 mm (Figure 4). We also estimated that 31,331 largemouth bass were caught and released, or that each bass in the population was caught and released an average of 3.6 times during the study (Figure 2). Very few fish smaller than 190 mm (>5%) were found in the sample.

Between April 4 and September 18, anglers expended an estimated 57,153 hours fishing in Paddock Reservoir (Figure 5). Anglers caught an estimated 107,938 fish at a rate of 1.89 fish per hour (Figure 6) and harvested an estimated 1.32 fish per hour. Black crappie comprised 92% of the total harvest (Figure 7). Largemouth bass comprised another 1.3% of the creeled fish at a catch rate of 0.02 fish per hour (Figure 8). Bullhead catfish totaled 7.12 of the harvest and were harvested at 0.09 fish per hour (Figure 9). Released crappie and largemouth bass increased the catch rate 0.57 fish per hour (Figure 10). The highest catch rates occurred during Period 6, with 3.46 fish per hour and 2.92 crappie per hour being caught. Period 6 also had the lowest use during the study. Low water and limited boat access during this time reduced angling pressure.

We estimated a harvest of 68,918 crappie, 970 largemouth bass, and 5,331 bullhead catfish. Sixty percent of the anglers fished entirely from boat, 25% from the bank, 9.1% from both a boat and bank, and 6.5% used only float tubes (Figure 11). Lures were used by 66% of the anglers, 20% using both lures and bait, 11.1% using only bait, and 2.5% were fly fishing (Figure 12).

Although nearly 73% of the anglers interviewed targeted crappie as their preference (Figure 13), we asked the preference and release questions due to the high rate of incidental catch of bass. When observing either the four or five life-sized pictures and being asked which size was preferred, anglers consistently preferred to catch the largest bass (Figures 14 and 15).

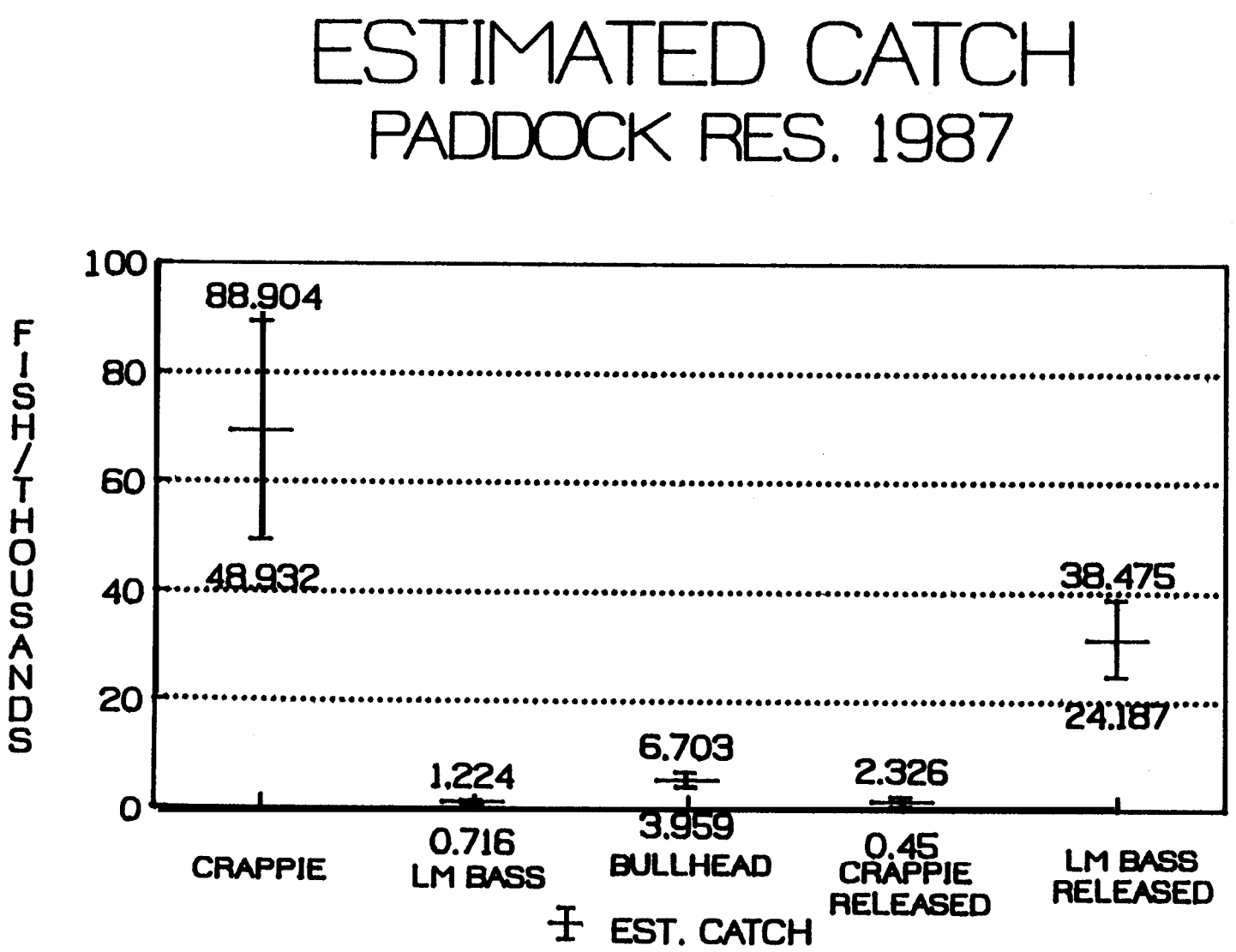


Figure 2. Estimated angler catch at Paddock Reservoir from 4 April to 18 September.

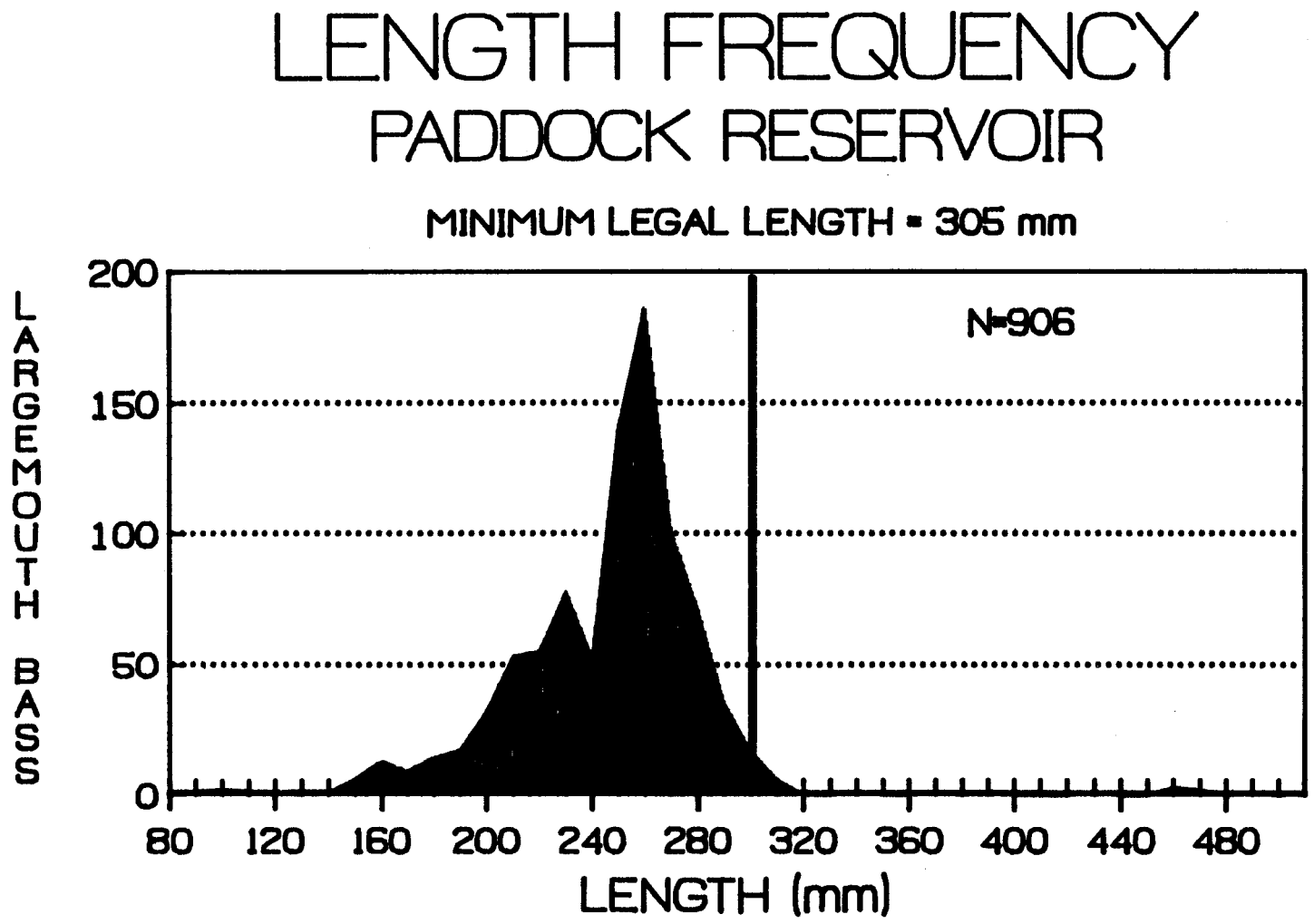


Figure 3. Length frequency of 906 largemouth bass sampled in April 1987 at Paddock Reservoir.

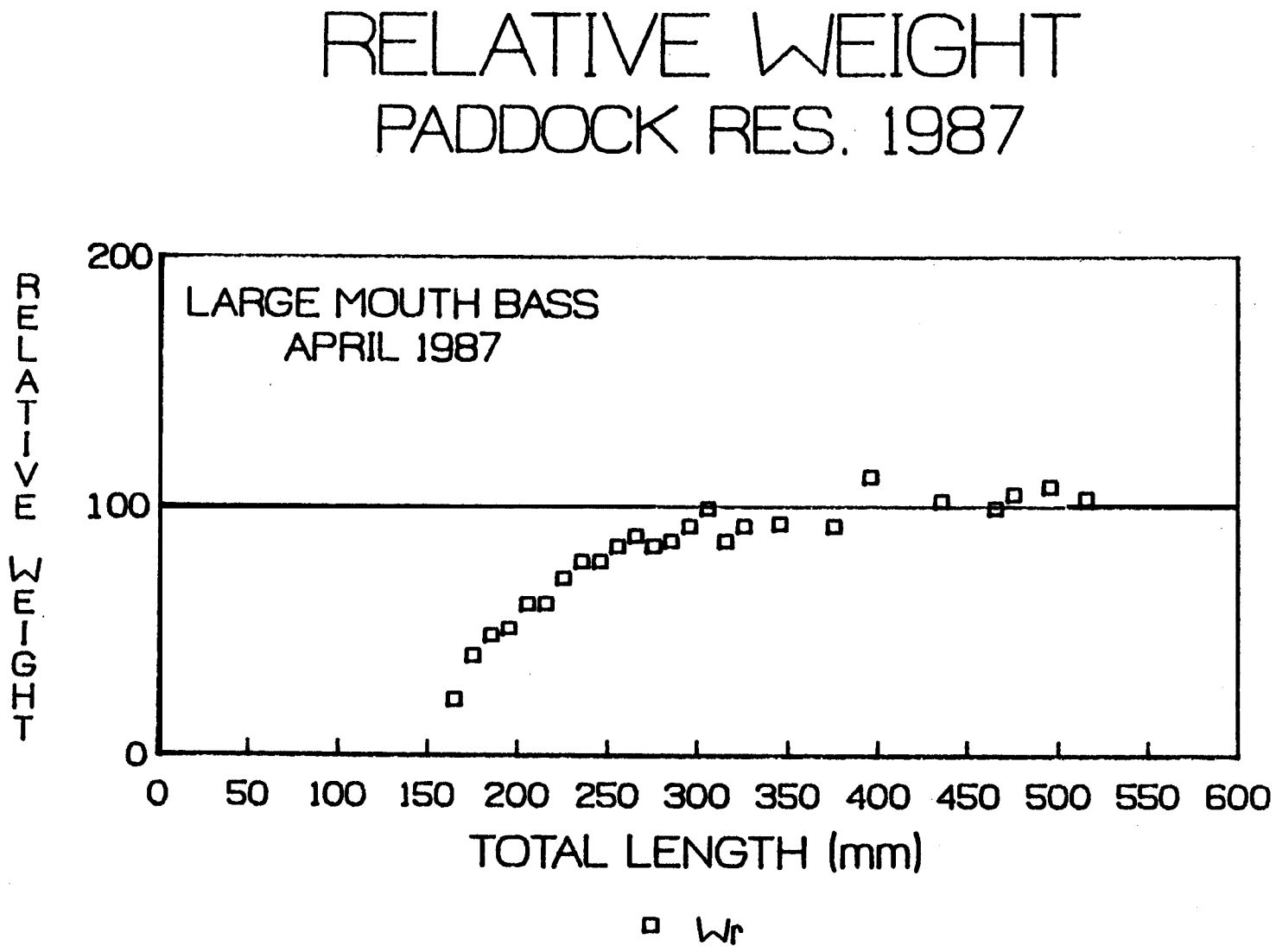


Figure 4. Relative weight of largemouth bass sampled in Paddock Reservoir, April, 1987.

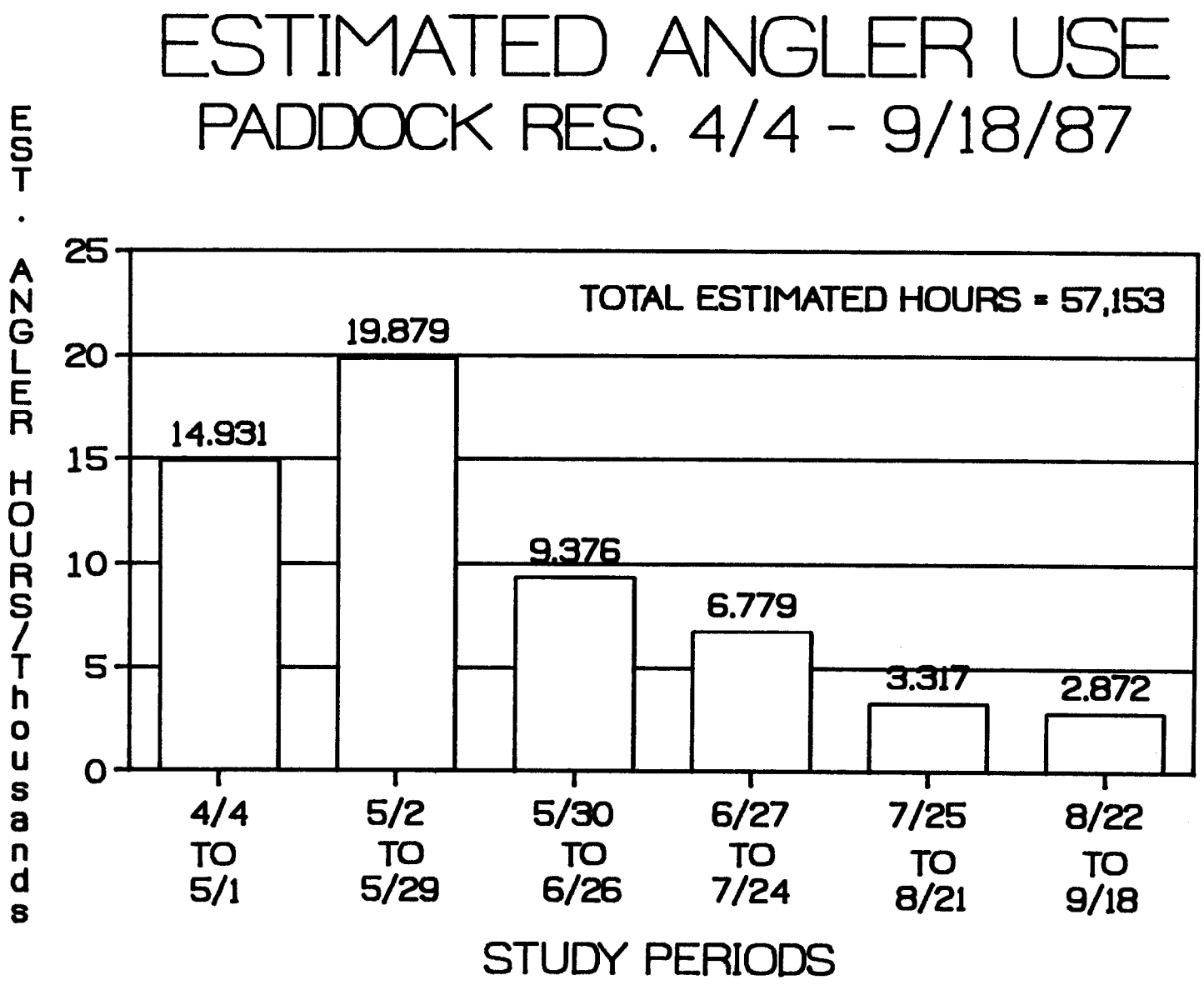


Figure 5. Estimated angling effort on Paddock Reservoir during the six study periods, 1987.

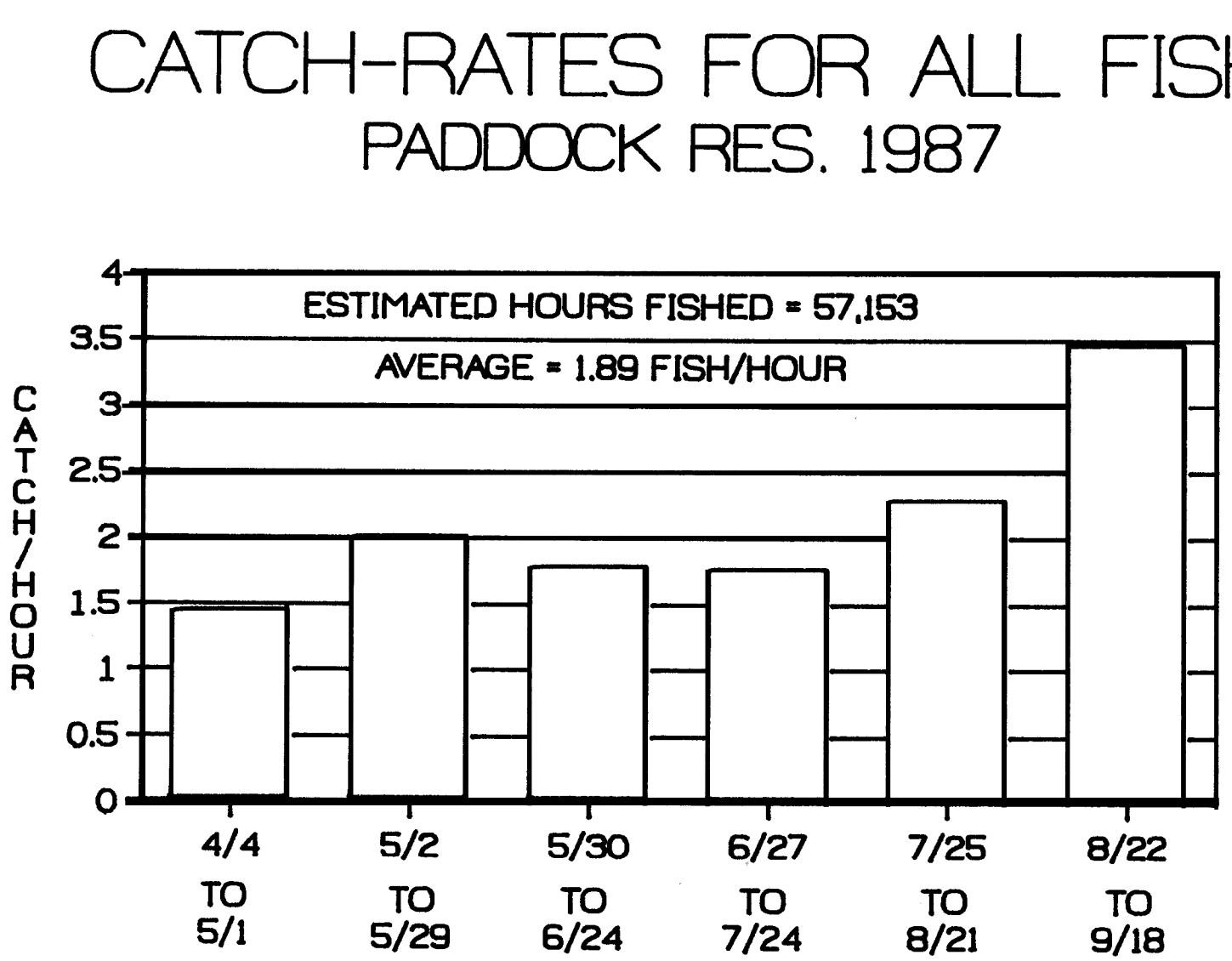


Figure 6. Estimated total catch rates for game fish in Paddock Reservoir, 1987.

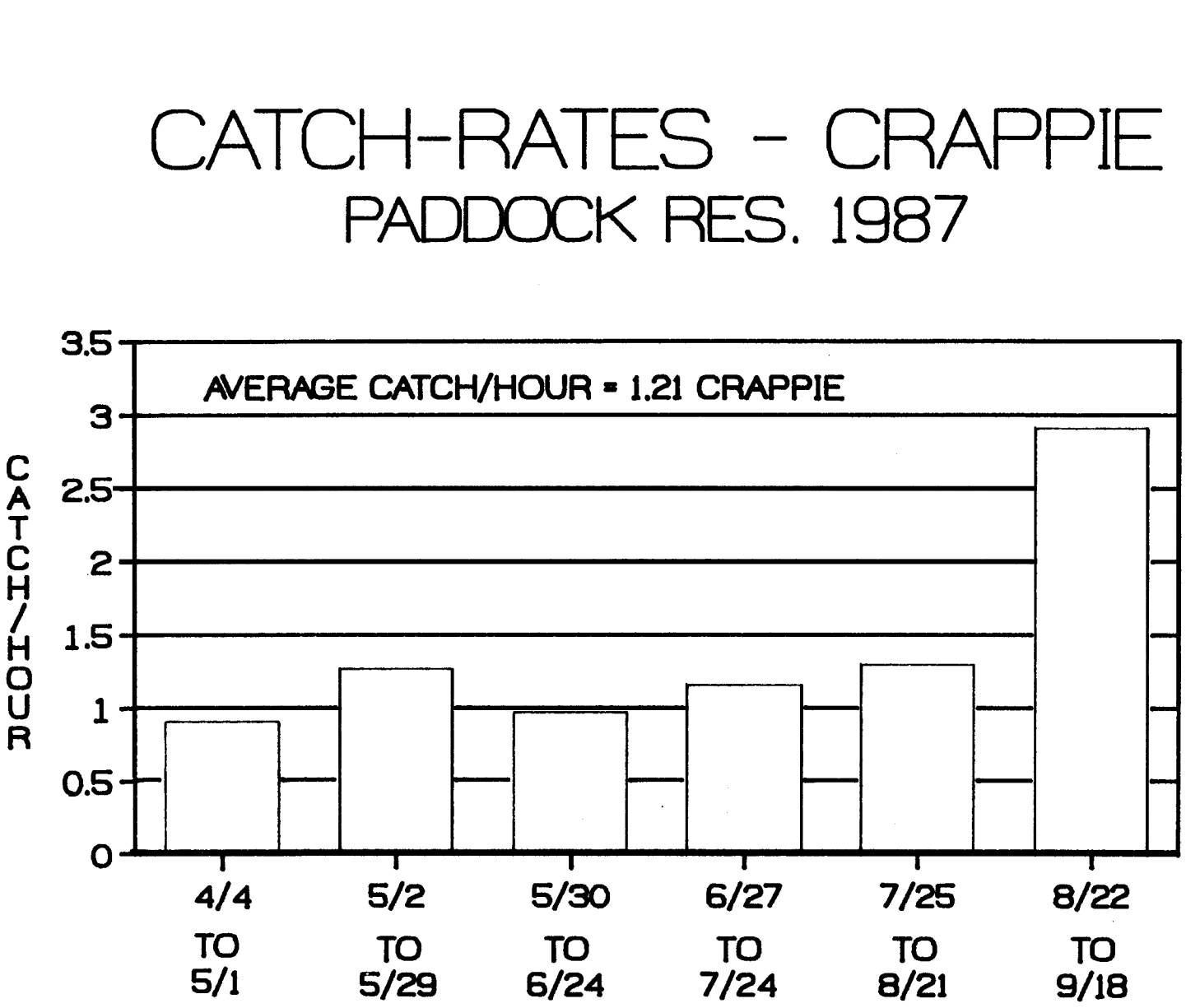


Figure 7. Estimated catch per hour of crappie at Paddock Reservoir, 1987.

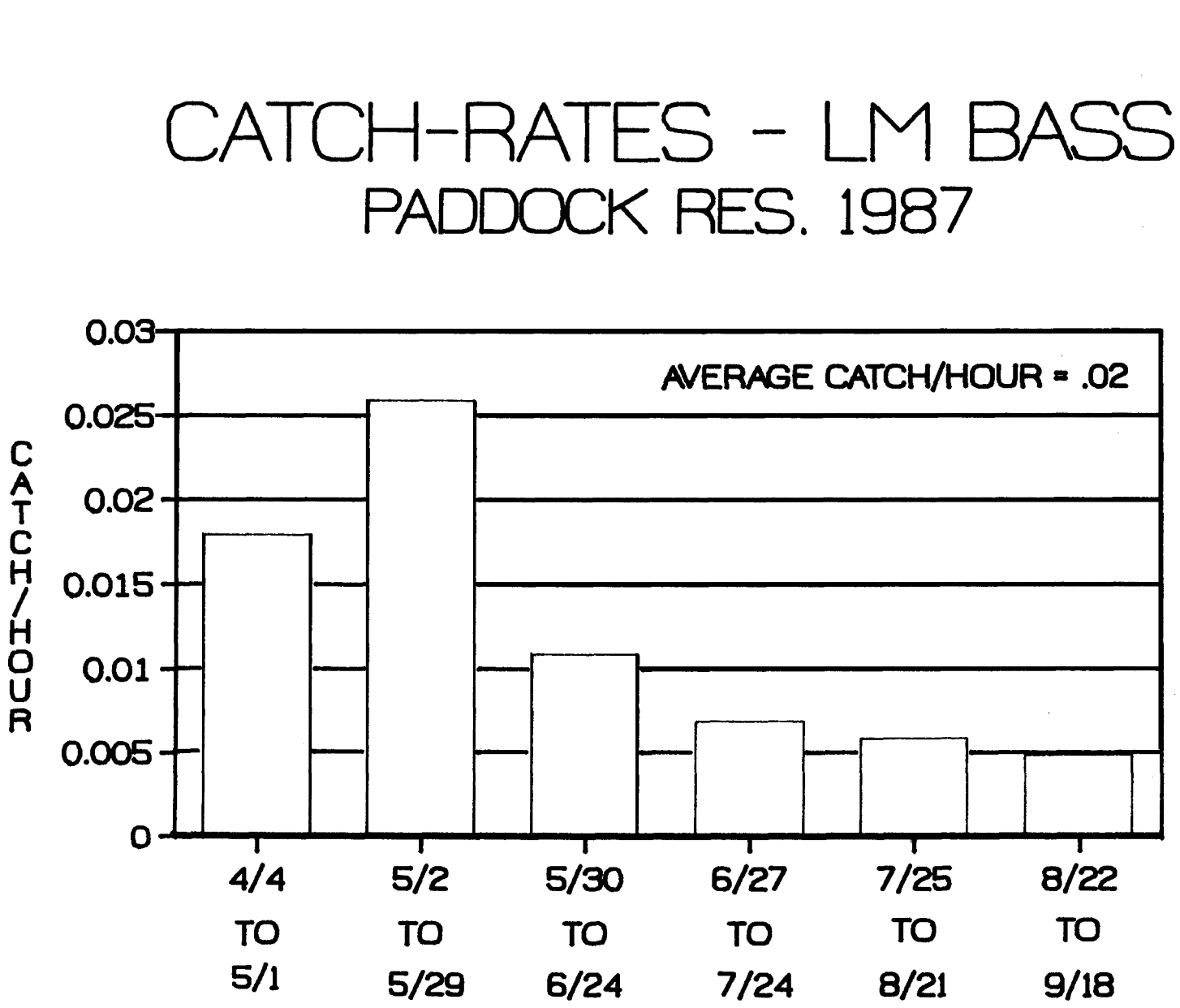


Figure 8. Estimated catch rate of largemouth bass per hour at Paddock Reservoir, 1987.

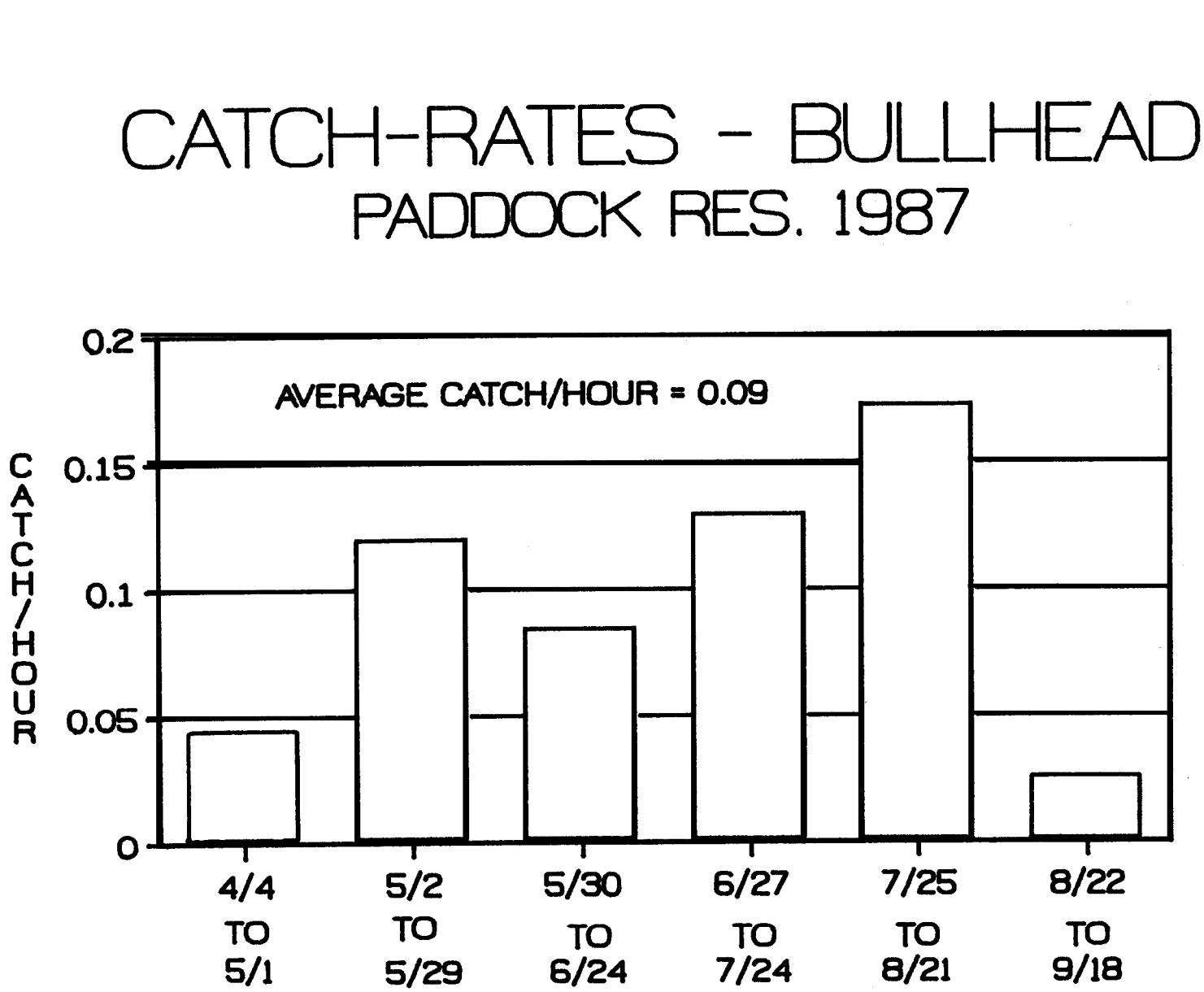


Figure 9. Estimated catch rate of bullhead catfish at Paddock Reservoir, 1987.

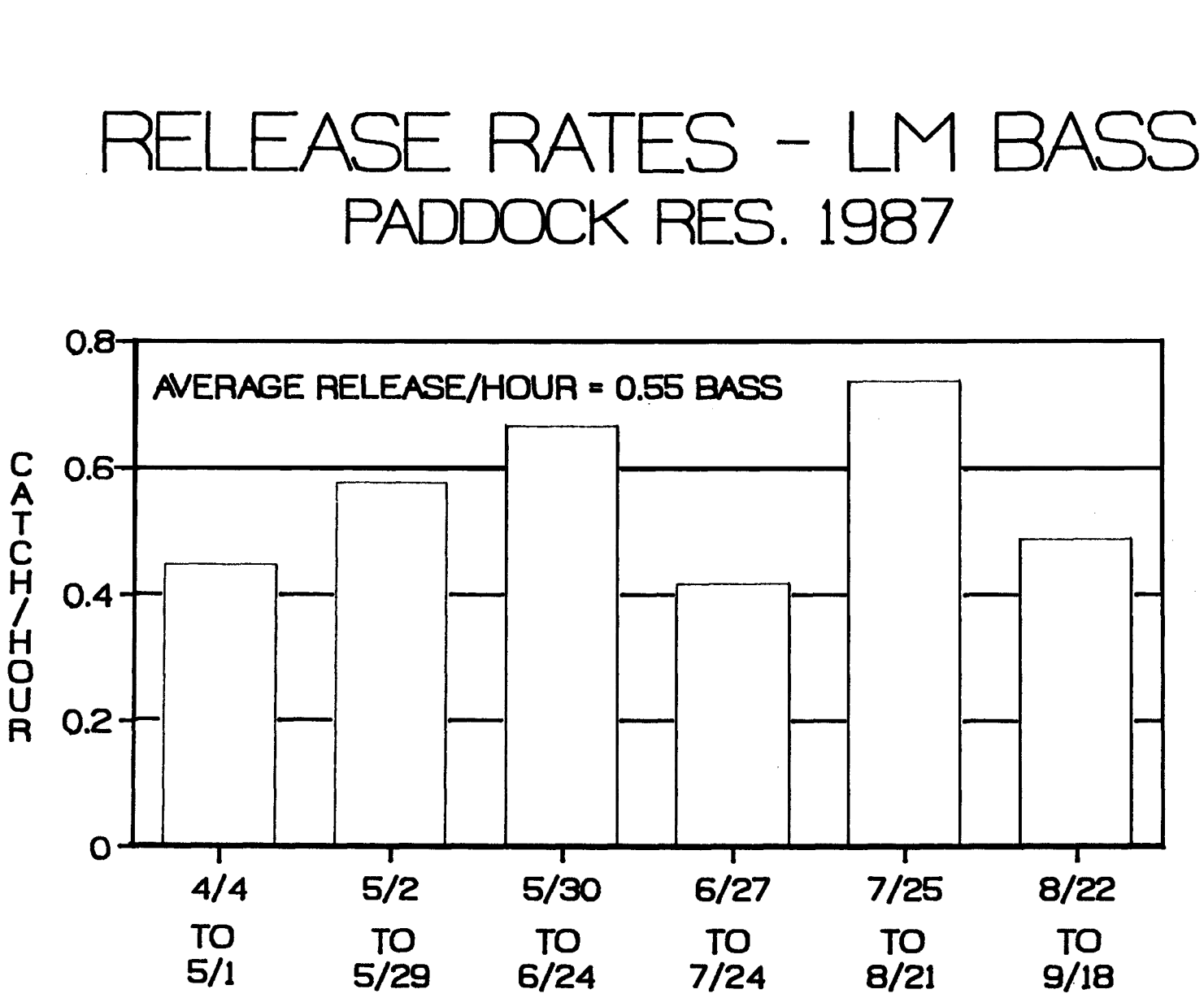


Figure 10. Estimated release rate of largemouth bass at Paddock Reservoir, 1987.

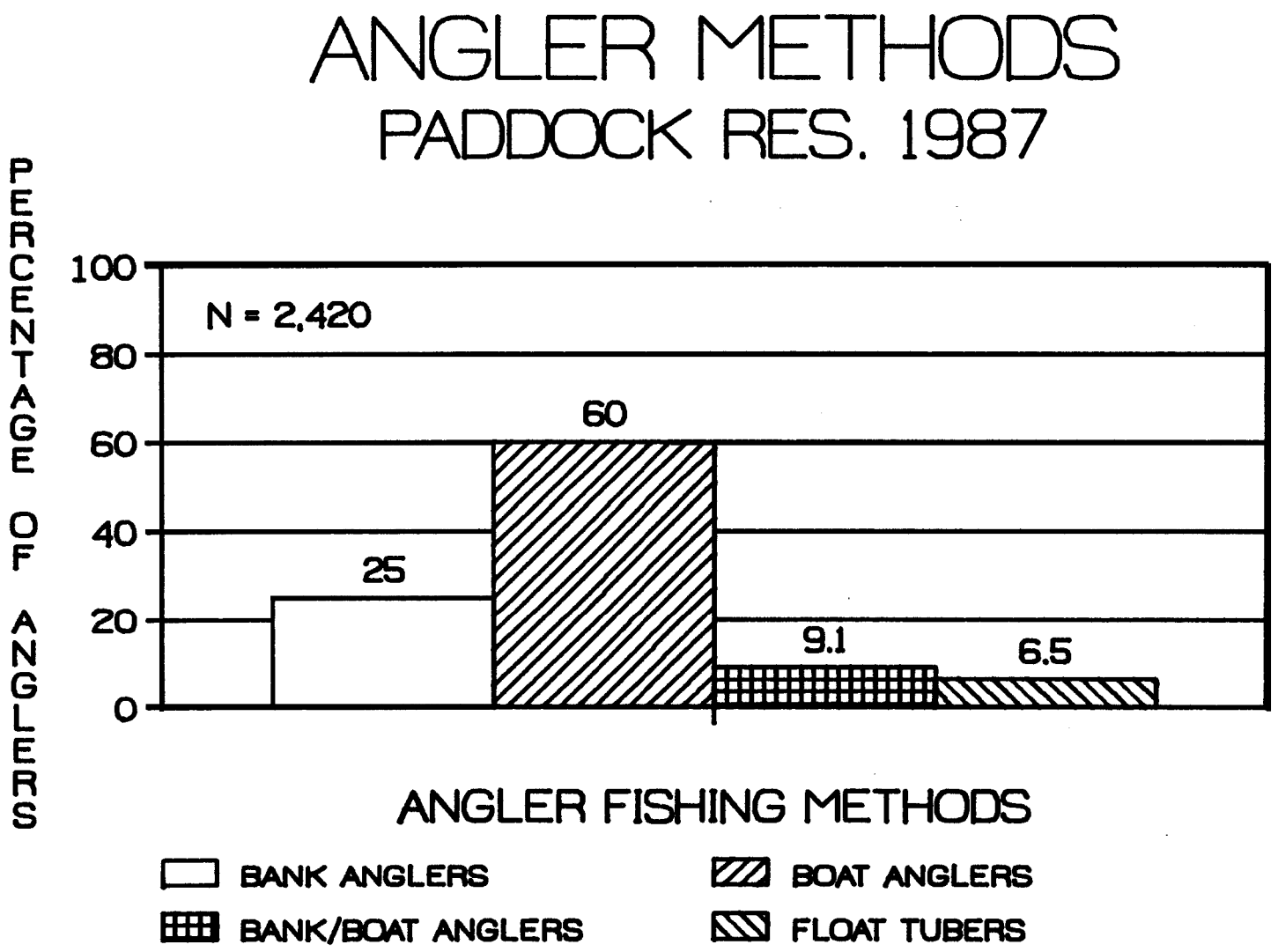


Figure 11. Angler fishing methods, Paddock Reservoir, 1987.

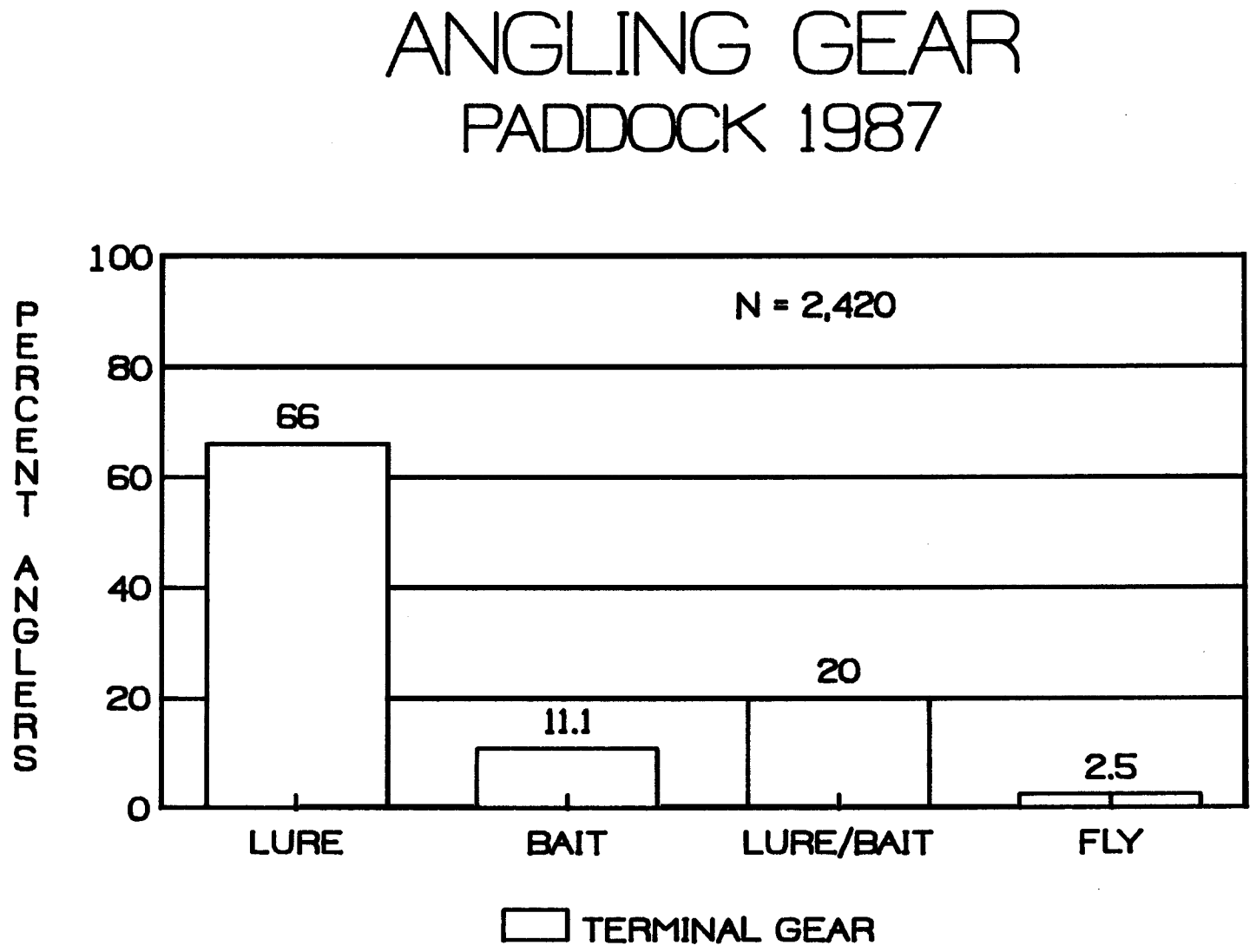


Figure 12. Terminal gear used by anglers at Paddock Reservoir, 1987.

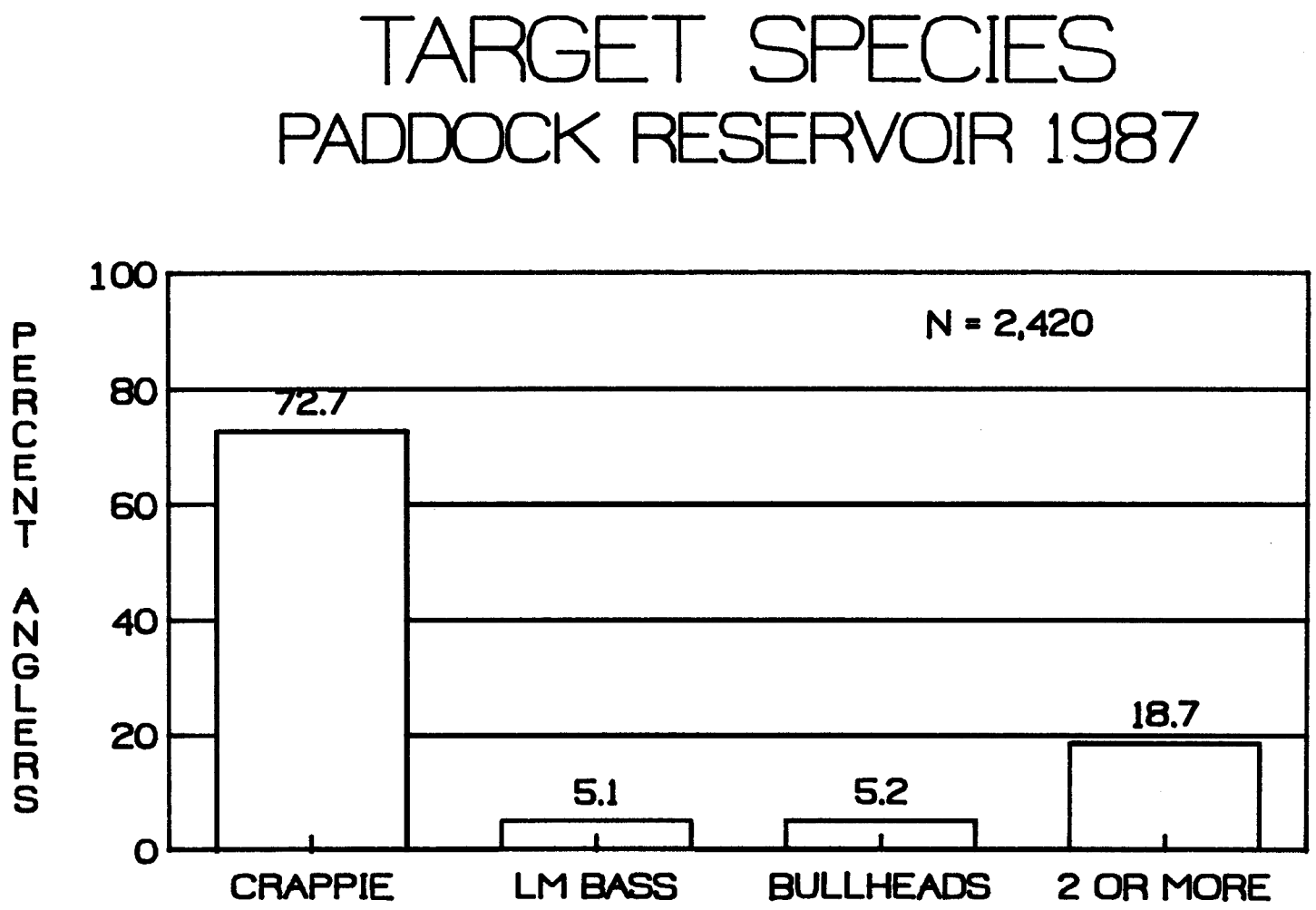
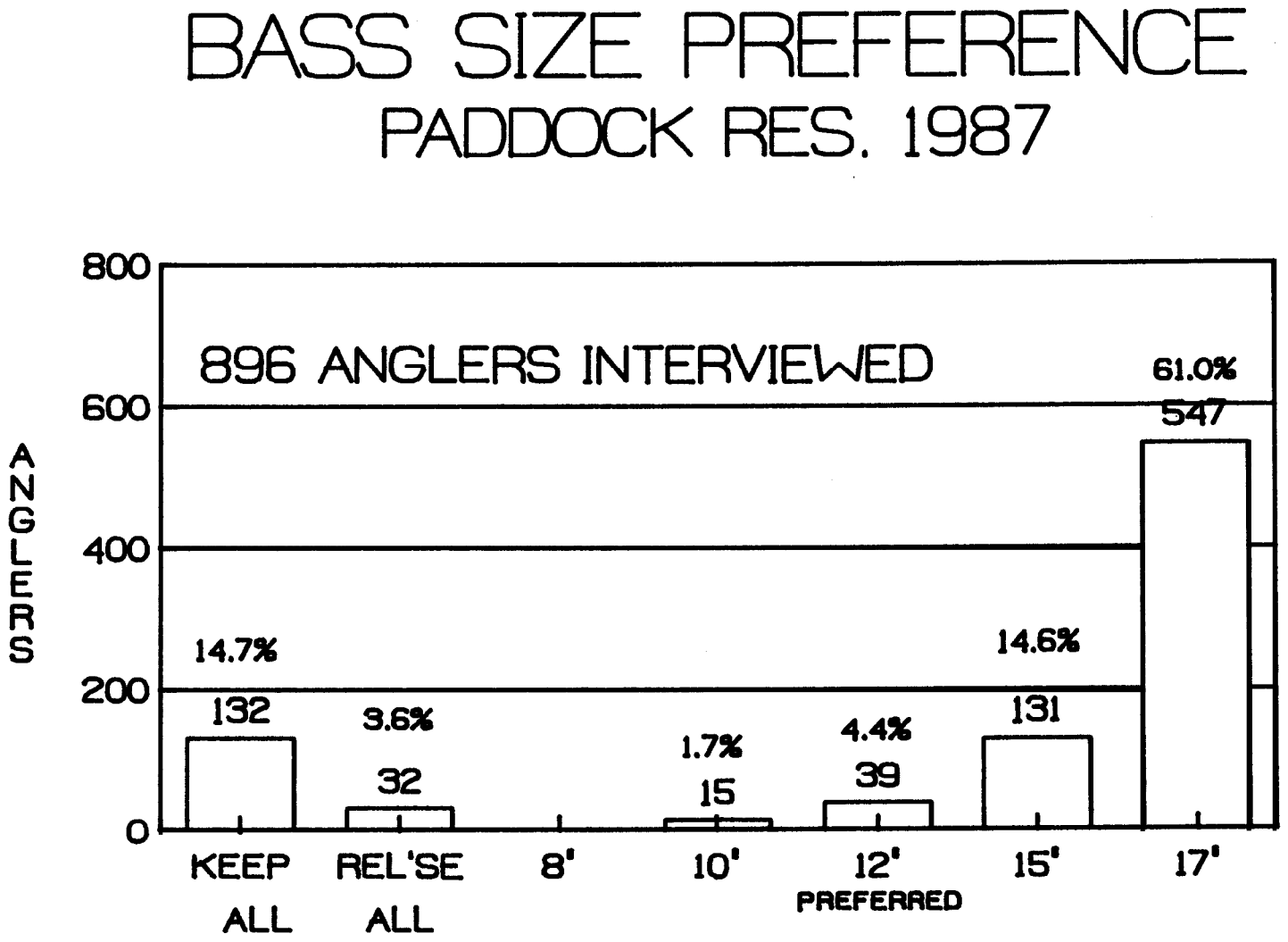


Figure 13. Species preferred by anglers at Paddock Reservoir, 1987.



4 BASS PICTURES (April to Mid May)

Figure 14. Angler preferred size of largemouth bass when shown four scaled pictures, Paddock Reservoir, 1987.

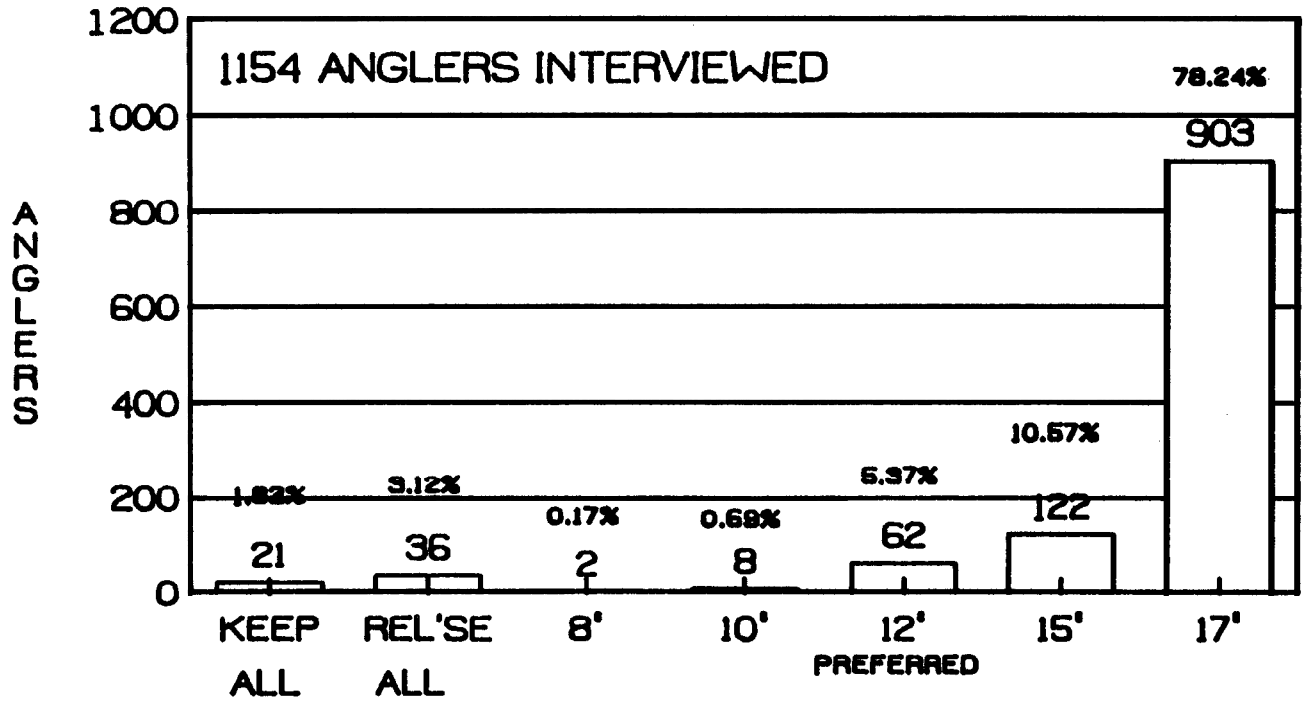


Figure 15. Angler preferred size of largemouth bass when shown five scaled pictures, Paddock Reservoir, 1987.

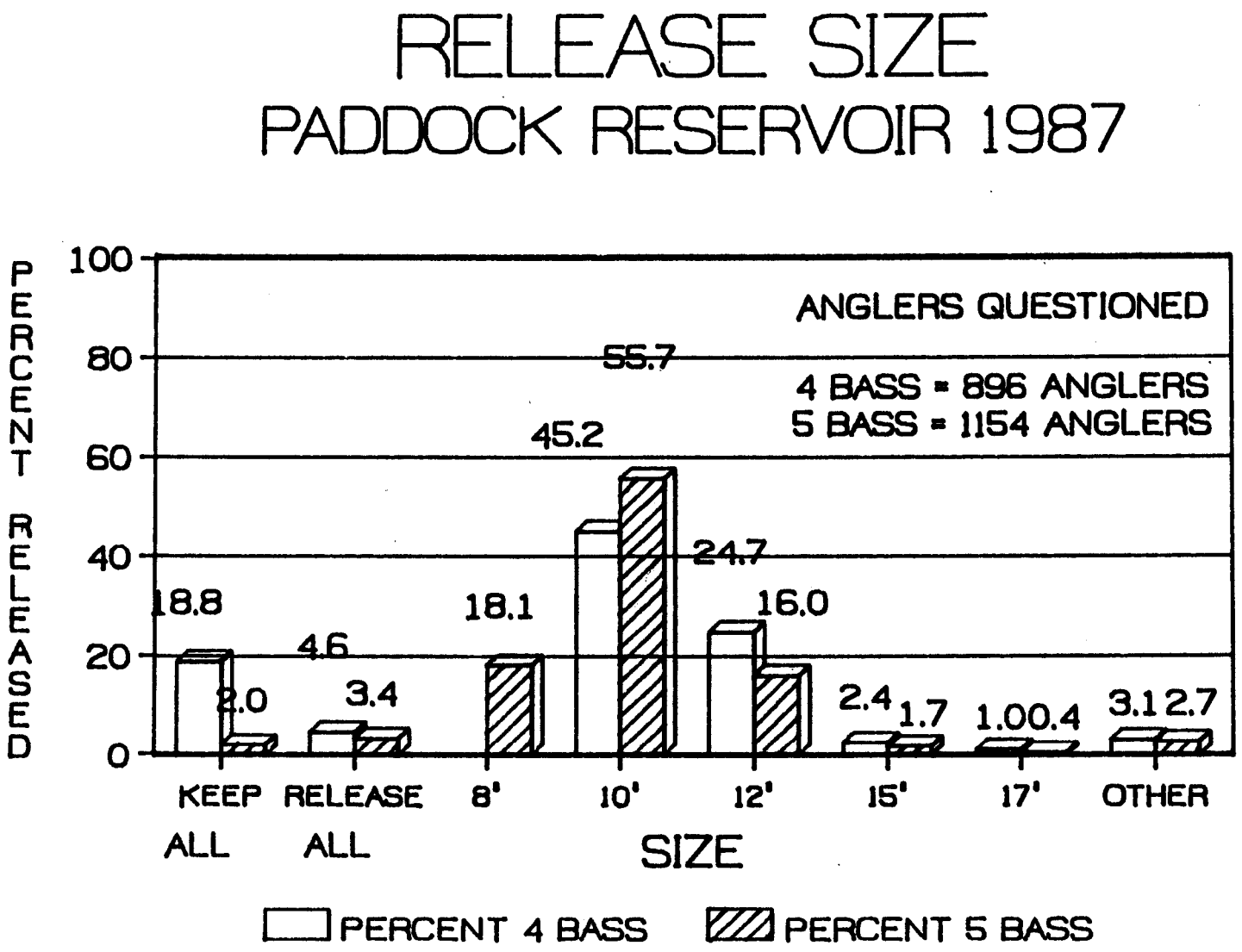


Figure 16. The size of largemouth bass that anglers would release when questioned using four and five scaled pictures, Paddock Reservoir, 1987.

After anglers were shown life-sized pictures of 10, 12, 15, and 17-inch bass, 18.8% stated they would keep and 4.6% said they would release all the pictured fish (Figure 16). An additional 45.2% said they would release 10-inch fish but keep all larger fish. About half this number, 24.7%, stated they would release 12-inch or smaller fish and keep the larger bass. Few anglers preferred to release fish 15 inches or greater.

When anglers were asked the same question but with an additional eight-inch bass in the pictures, very few (2.0%) stated they would keep all the bass. All bass would be released by 3.4% of the anglers, approximately the same response found with four fish pictures (4.6%). The eight-inch fish would be released by 18.12 of the anglers, with an additional 55.7% of the anglers releasing 10-inch or smaller fish. Both of these answers reflect an increase in the number of anglers that would keep smaller fish than when questioned with the four fish pictures (73.8% versus 45.2%). With more fish being harvested at the smaller size, the anglers' responses with releasing 12-inch and greater fish are less than with four pictures.

DISCUSSION

The low PSD (4) and W_r of largemouth bass indicate poor survival of older age classes, food shortages, and habitat problems in Paddock Reservoir. High angler utilization of this resource accounts for low densities of older age classes of black bass. Investigators, when sampling the reservoir, also found very limited fish habitat structure that serves as escapement or nursery areas for young-of-the-year fish. The lack of ages I and II bass and the low Wr of smaller fish indicate that the older bass appear to be utilizing the young bass as their forage base.

Introduction of another forage base for the black bass and large crappie plus construction of artificial habitat for nursery areas for young fish are needed to reduce the extreme cyclic population characteristics now appearing in the largemouth bass population and, to a lesser extent, in the crappie population.

With reduced water levels, improvements in angler access by lengthening launching sites may increase angler utilization during late summer, low water, high angling success periods.

Before we began this study, we were aware of the crappie population being at its cyclic low. As a result of this and the limited entry of boats during late summer (periods 5 and 6), we feel all population estimates and angler estimates are below the angling pressure and catch of normal years.

When anglers were questioned using the bass pictures, the 10-inch bass appeared to be the size of bass the "keep all" anglers (four pictures) would harvest. Two-thirds to three-fourths of anglers would keep fish less than 12 inches (current minimum legal size). When an officer assisted the clerk in angler interviews, he found nearly 5% of the anglers had bass less than legal length. We appear to be getting high compliance to the current minimum size regulation when compared to the number of anglers that would prefer black bass less than 12 inches. An increase in public education for the 12-inch minimum by the Department may increase acceptance of the 12-inch regulation.

JOB PERFORMANCE REPORT

State of: Idaho

Name: REGIONAL FISHERY MANAGEMENT INVESTIGATIONS

Project No.: F-71-R-12

Title: Region 3 (Boise) Lowland Lakes and Reservoirs Investigations

Job No.: 3(GC)-b[2]

Period Covered: July 1, 1987 to June 30, 1988

ABSTRACT

At Deadwood Reservoir, we sampled the relative abundance of game fish and continued monitoring of kokanee growth. The populations of kokanee are similar to 1986, and the cutthroat populations appear to be increasing.

The number of legal size largemouth bass in Lake Lowell was estimated to be 6,118 fish. Heavy angling pressure and low water in 1987 required that catch-and-release regulations be implemented to preserve the mature bass population.

Halverson Lake and Emmett Airport ponds had stunted bluegill and low proportional stock density for bass. Channel catfish introductions are recommended to reduce bluegill populations. Caldwell Pond has high angler exploitation. Reducing angler pressure by offering additional angling opportunities in the immediate area may improve this fishery. Duff Lane Pond average depth must be increased to enhance this fishery. Veteran Park has high exploitation of its fishery resources and needs nursery areas for rearing young-of-the-year warmwater fish. Indian Creek Reservoir, with its constant wave action and poor upstream land practices that result in turbid water, needs a series of dikes. The dikes could reduce wave action, increase vegetation, and increase shoreline habitat, thus improving the clarity of the water and the production potential for game fish.

Artificial habitat sampling found higher densities of warmwater fish than found in natural shorelines of similar depth. Artificial structure at C.J. Strike Reservoir and Veterans Park are providing nursery areas for warmwater fish. The structure at Lake Lowell is providing cover for large bass and bluegill during low water.

Authors:

Brent Mabbott, Regional Fishery Biologist
Terry Holubetz, Regional Fishery Manager

OBJECTIVES

1. To monitor angler use and harvest, species composition, relative abundance, age structure, and other life history data for fish populations in selected lowland lakes and reservoirs within the boundaries of the Idaho Department of Fish and Game's Region 3.

2. To place additional habitat structures in selected lowland lakes to enhance angler harvest and juvenile fish survival.

TECHNIQUES USED

To **evaluate** the health of black bass and bluegill populations in selected lowland lakes and reservoirs, we **gathered** population data to estimate the proportional stock density, PSD (Anderson 1976, 1978), and **relative** weight, Wr (Wege and Anderson 1978). The PSD population indices will reflect the balance of populations and is expressed as:

$$PSD = \frac{\text{number} > \text{minimum quality length}}{\text{number} > \text{minimum stock length}} \times 100$$

Where:

PSD .. proportional stock density as a percent.

Minimum quality length = 300 mm for largemouth bass, and
280 mm for smallmouth bass.

Minimum stock length [a] 200 mm for largemouth bass, and
180 mm for smallmouth bass.

The minimum stock length is that length of a fish species when it is recruited to the fishery. The minimum quality length is based on a percentage of the world record length.

A population is considered balanced with PSD values between 40 and 60. PSD values lower than 40 are indicative of population stunting or those with poor survival of older age groups. PSD values greater than 60 indicate populations with poor juvenile recruitment.

The relative weight index (Wr) is expressed as:

$$Wr = \frac{W}{W_s} \quad X\ 100$$

Where:

W_r = relative weight,

W = individual weight, and
W_s = standard weight.

Standard weights have been compiled from data reported and synthesized by Wege and Anderson (1978). The ideal standard weight equation should produce W_r values of about 100 for a population without production or habitat problems (Anderson and Gutreuter 1983). The standard weight equation for largemouth bass is:

$$\log_{10} W_s = 5.316 + 3.191 \log_{10} L$$

and for bluegill is:

$$\log_{10} Ws = -5.374 + 3.316 \log_{10} L$$

Where:

W_s = standard weight for a length group, and
L = length of individual.

W_r values below 100 indicate forage limitations.

To sample bass populations, we used DC electrical current. Power was supplied by a 5.0-KW generator. The AC current was then rectified to a pulsed DC current with a Coffelt VVP 2 C pulsator. We used a fixed negative electrode and a mobile positive electrode which also served as a capture net. We mounted all gear in either a 16-foot aluminum river sled powered by a 95-horsepower outboard motor with a jet convertor, or a 15-foot manually powered river boat.

From each game fish sampled, we obtained a measurement of total length. From a subsample of the black bass and bluegill collected, we obtained measurements of live weight and gathered scales for age and growth.

Material for habitat structures was transported using private, Deer Flat National Refuge, and Department vehicles. Materials were then transported onto the ice at Lake Lowell and C.J. Strike using car hoods for sleds. The car hoods were pulled using snow machines and all terrain vehicles (ATVs). Structures at Lake Lowell were placed on ice over water 6 to 8 m in depth and at C.J. Strike over water depths of 1 to 2 m. Concrete blocks and sand bags were attached to the structures to sink them. Trees, tires, stumps, and weights were connected using 12.5-gauge galvanized wire.

FINDINGS

Deadwood Reservoir

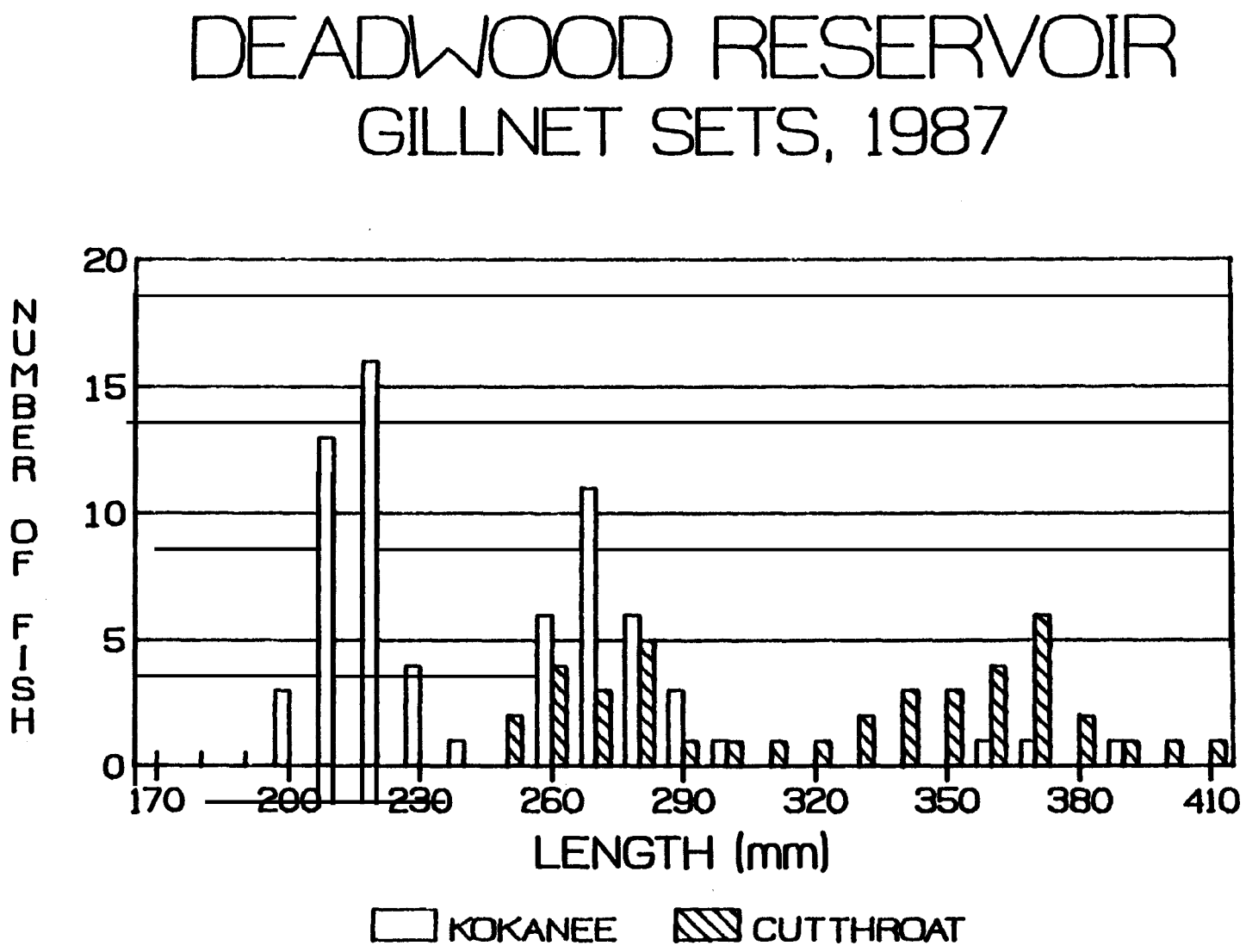
At Deadwood Reservoir, we continued efforts to monitor the kokanee salmon population response to the spawning migration barrier placed across Deadwood River. During the month of October, we set four horizontal gill nets: two nets on the surface and two nets near the bottom of the reservoir. Nets remained in the water for a total accumulative time of 48 hours.

Gill net sets in Deadwood Reservoir captured 67 kokanee, 42 cutthroat trout, 4 fall chinook, 7 rainbow trout, 32 mountain whitefish, 2 bull trout, and 2 redside shiners. Kokanee in the sample ranged in total length from 185 mm to 370 mm, with a total mean length 229 mm. From the length frequency data (Figure 1), there are two strong modes: one at 205 mm, the same as 1986 (Reid 1987), and another at 255 mm. From kokanee aged in 1987, no age I fish were captured. Age II fish varied in length from 185 mm to 225 mm and the age III fish from 240 mm to 285 mm. Several large female kokanee, 340 mm to 370 mm, were captured and would have spawned in 1988.

Gill net sets captured 42 cutthroat trout compared to 17 captured in 1986 (Reid 1987). The cutthroat trout mean length was 312 mm, with the largest being 520 mm and 1.6 kg. The nets also captured four chinook salmon compared to 14 in 1986. The chinook ranged from 295 mm to 500 mm (1.65 kg), and the two largest were mature males.

The kokanee population is, from gill net results, maintaining current numbers and also may be showing a slight increase in size when compared to 1986.

Beginning in the 1988 field season, we plan to begin assessing magnitude of spawning escapement and gather necessary information to develop spawner-recruitment curves, thereby defining optimum escapement levels for this reservoir system.



Excludes (1) 520mm Cutthroat

Figure 1. Lengths of kokanee and cutthroat trout sampled in Deadwood Reservoir, October, 1987.

Lake Lowell

A population estimate of largemouth bass greater than 305 mm (12 inches) was conducted using similar techniques as at Paddock Reservoir. The Schnabel method was used, and the recapture was evaluated during the weigh-in at two bass tournaments. Anglers at these tournaments caught and released 447 largemouth bass greater than 305 mm.

During four sampling periods, we marked 210 legal size (12 inches or greater) largemouth bass. In the sample, we recovered seven marked fish; and using the Schnabel method (Ricker 1975), we estimated 6,118 (C.I. 3,097-14,394) legal largemouth bass in Lake Lowell. The PSD of largemouth was 61 and 41 for bluegill. Both PSDs are indicators of a healthy population. The length frequencies of bass indicate good year classes in all size (Figure 2).

Lake Lowell receives heavy angler pressure due to its close proximity to population centers in southwestern Idaho. Angling success is good, with catch rates of 1.3 fish per hour. Current bass regulations appear to be successful in allowing survival of mature bass to spawning age, thus producing the balanced age classes of bass in the population.

In 1987, Lake Lowell was closed to the harvest of bass after August 1 because of low water. The low water and subsequent concentrations of bass on limited structured areas invited excessive harvest of mature bass. Current management plans of habitat structure introductions will disperse concentrations of bass during low water and may allow for general regulations the entire year.

Duff Lane

Duff Lane is located in T4N, R2W, S8 and has approximately five surface acres. Electrofishing in early March 1986 captured three bullhead catfish. The maximum depth of the pond was nearly 2 m, but most of the pond has depths of 1.5 m or less. Duff Lane has biannual oxygen sags, which occur during the midsummer and under ice due to the high BODs. These sags have historically reduced or eliminated fish populations. Duff Lane Pond must be increased in depth to a minimum of 3.5 m to ensure fish survival with the associated reduction of weed growth.

During March and April of 1986, we introduced nearly 850 crappie, bullhead, bluegill, and largemouth bass into Duff Lane Pond. The fish were moved from Halverson Pond and from a pond being eradicated for future bass stocking.

Sampling the pond in 1987, similar to 1986, found excellent survival of the introduced fishes (Figures 3, 4, and 5). There were 172 fish collected, with many more bluegill and bullhead observed but not collected. Proportional stock densities for largemouth bass and bluegill were not calculated due to their recent introductions.

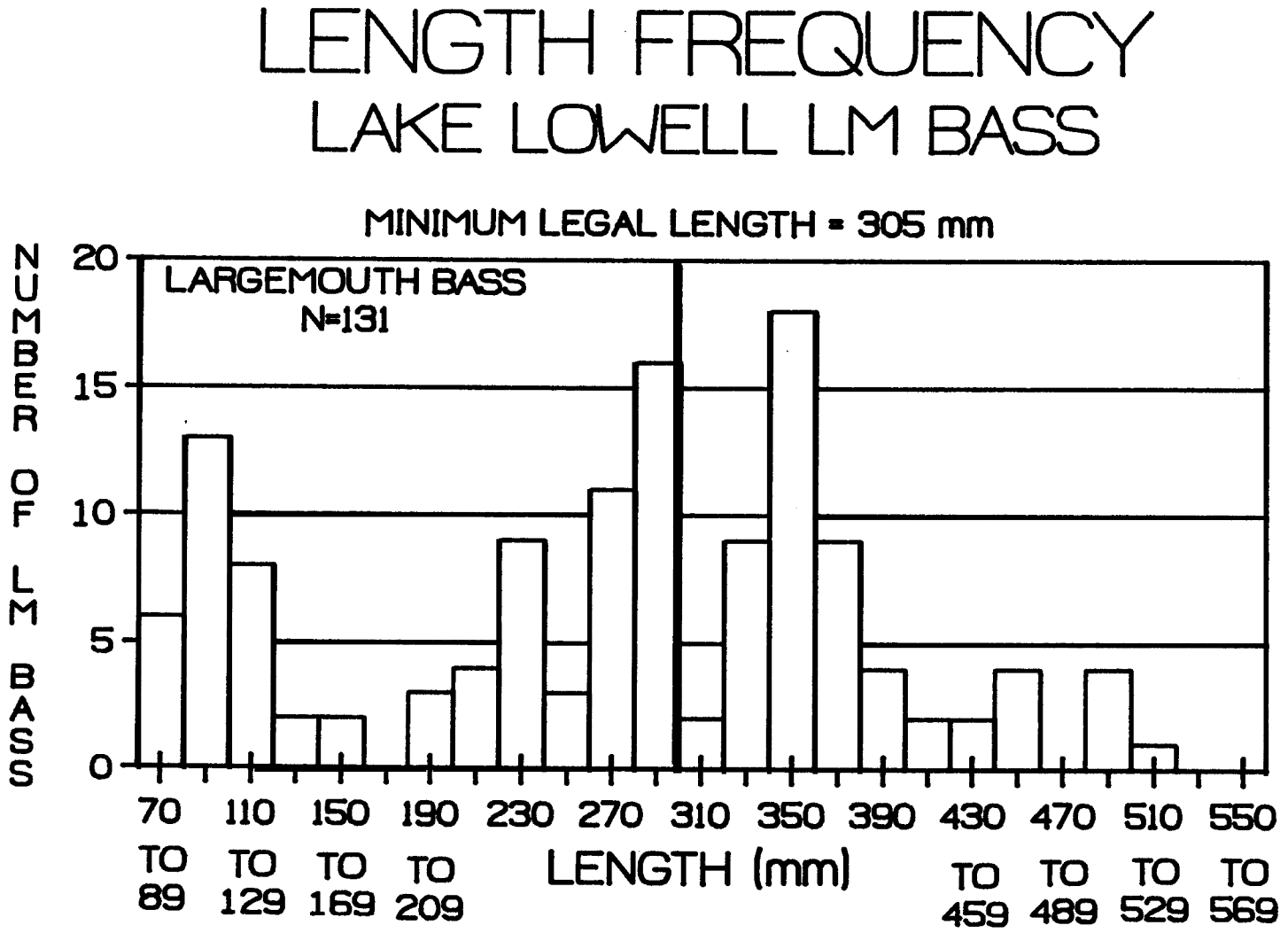


Figure 2. Length frequency of largemouth bass sampled in Lake Lowell, May, 1987.

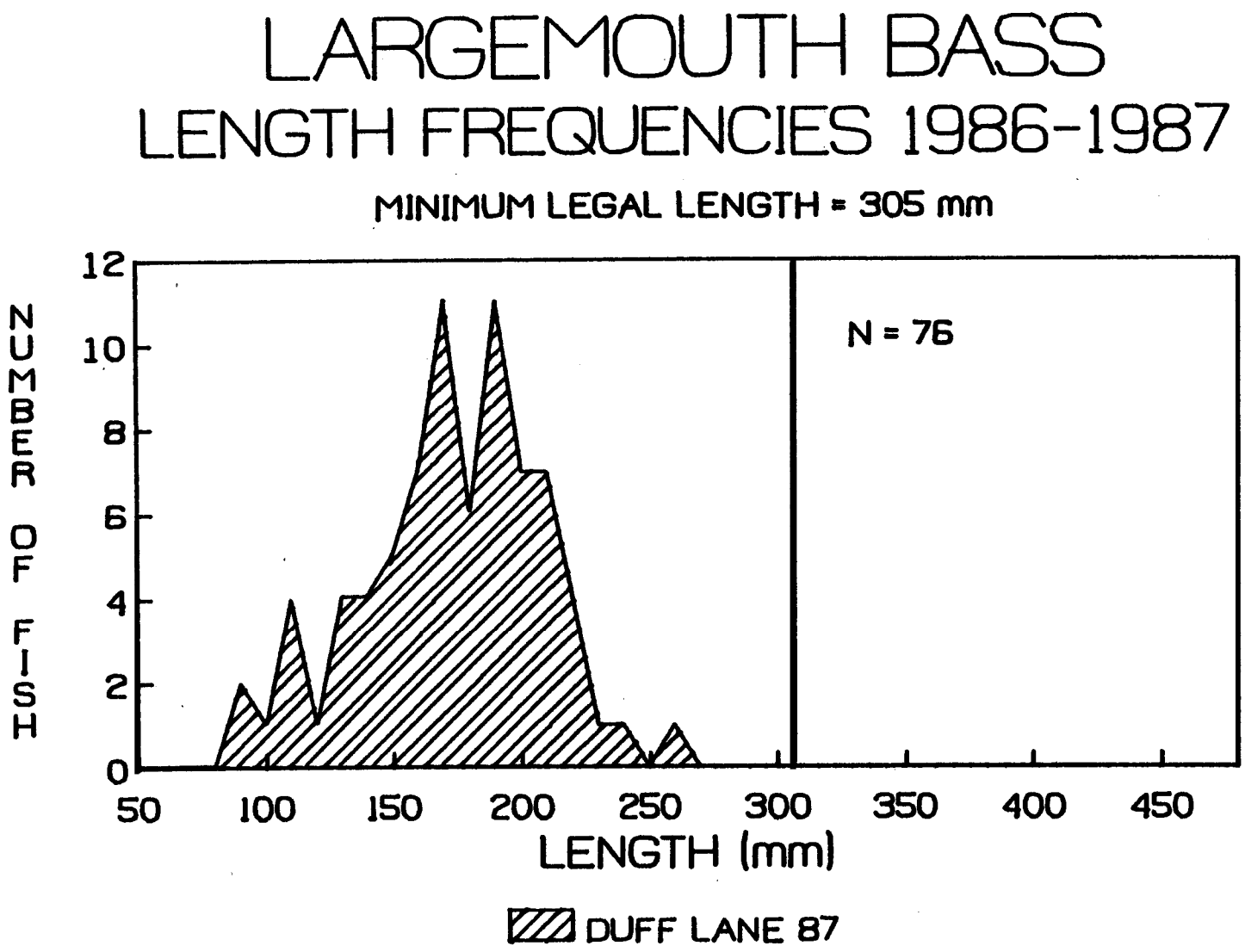


Figure 3. Length frequency of largemouth bass sampled at Duff Lane Pond, 1987.

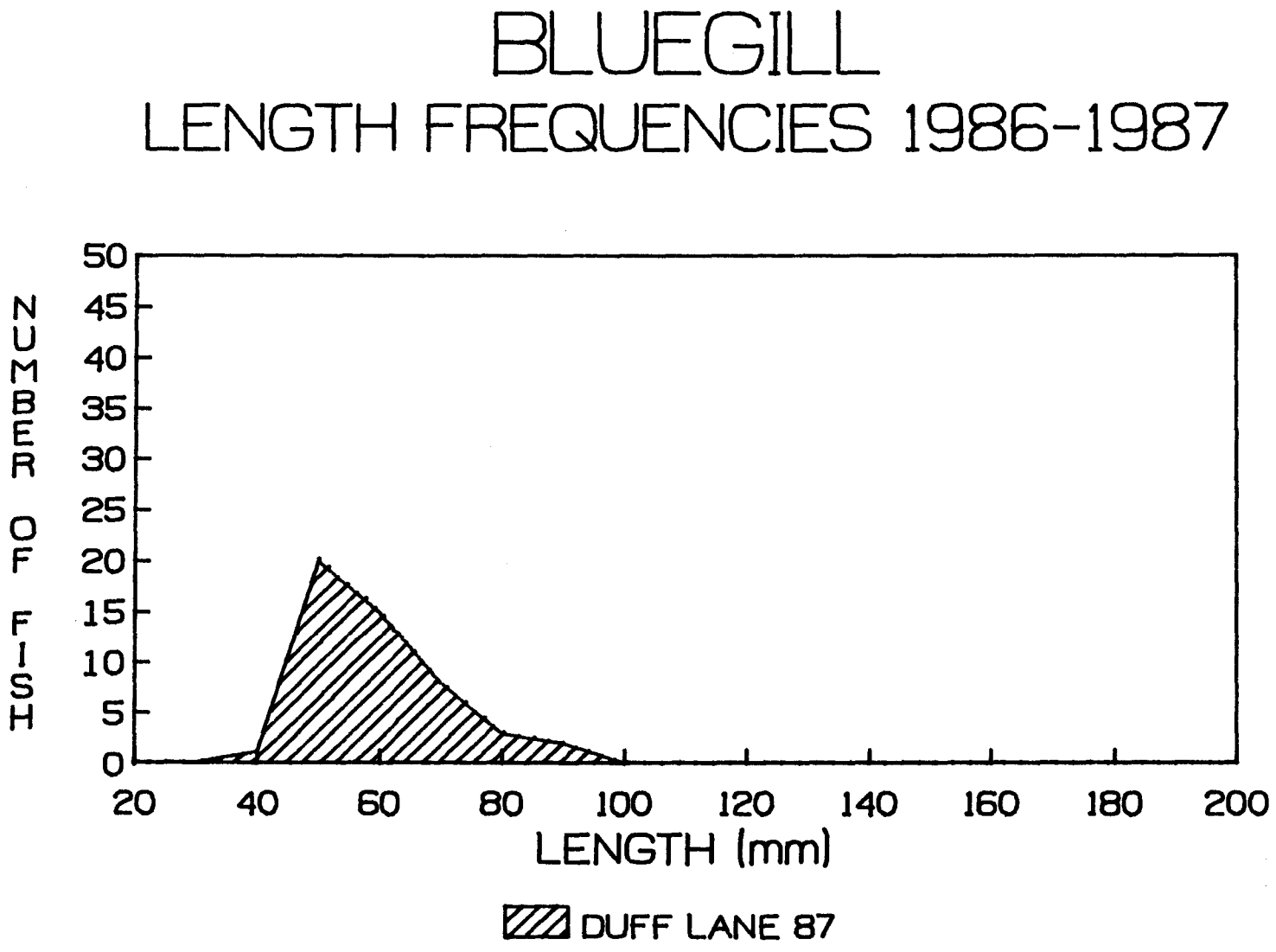


Figure 4. Length frequency of bluegill sampled at Duff Lane Pond, 1987.

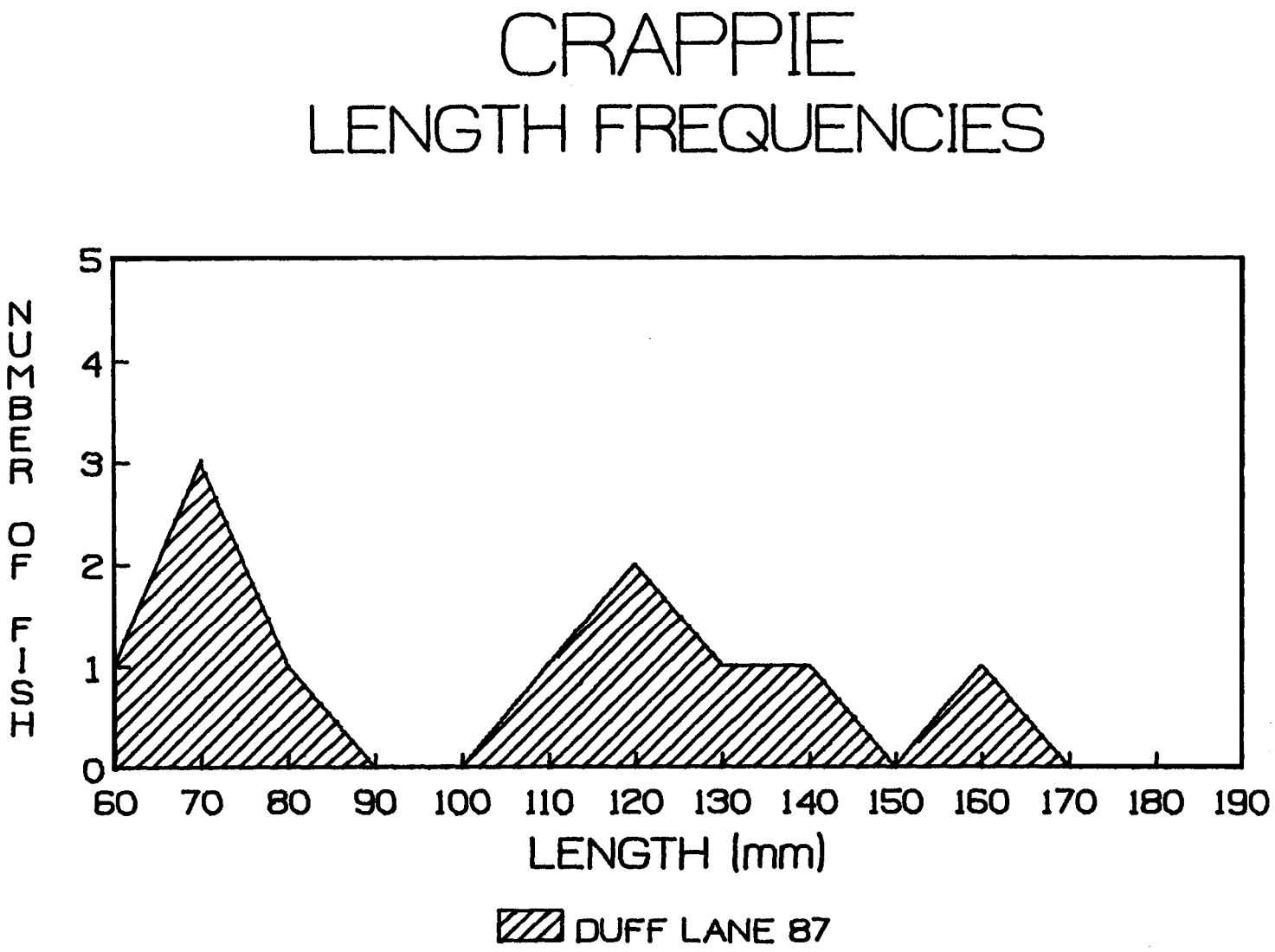


Figure 5. Length frequencies of black crappie sampled at Duff Lane Pond, 1987.

Indian Creek Reservoir

Indian Creek Reservoir is located in T1N, R4E, S28, 29, and 30 and has approximately 360 surface acres at capacity. It has a maximum depth of approximately 12 m and provides fair habitat of rocky shorelines at the dam and aquatic vegetation in the shallows. Habitat is greatly reduced with drawdowns during low water.

During the high water in the spring of 1986, crappie were observed going over the outlet spillway at a rate of five fish per minute. Water spilled at the outlet in 1986 for nearly four weeks.

Colloidals in Indian Creek Reservoir are **a** result of constant wave action and poor land practices in the drainage. A decrease in the suspended matter, and the resultant increase in water clarity, would increase angler success.

Construction of dikes in the reservoir to reduce wave action and increase the shoreline length would reduce colloidals, increase vegetation growth, and provide increased habitat for both the younger bluegill and older largemouth bass. The increased shoreline may also help reduce the loss of crappie over the outlet structure, as observed in 1986.

We sampled Indian Creek Reservoir in the summers of 1986 and 1987 and found largemouth bass (Figure 6), bluegill (Figure 7), bullhead catfish, and crappie (Figure 8).

Indian Creek largemouth had proportional stock density of 22 in 1986 and 17 in 1987. Live weights of largemouth sampled in 1986 varied from 20 g at 125 mm in total body length to 1,840 g at 465 mm in total length. Relative weight by size class was generally below the ideal of 100 (Figure 9), with extremes at 450 mm (W_r 132) and 145 mm (W_r = 66). The mean relative weight was 89 for the sample. PSD and Wr values obtained from Indian Creek Reservoir suggest poor survival of the older age groups of largemouth bass, with both reproduction and habitat limitations on the juvenile population.

Bluegill sampled in Indian Creek Reservoir had PSDs of 44 in 1986 and 76 in 1987. In 1986, the PSD appeared to indicate a well-balanced population, but the 1987 PSDs indicate that bluegill may be suffering from poor juvenile recruitment, possibly as a result of no spring inflows and the resultant low water with minimal escapement cover. Mean W_r values of 87.5 for bluegill (Figure 10) suggest the same problem that bass have with both habitat and reproduction limitations.

Halverson Lake

Halverson Lake is located in T1S, R1W, S31 and has approximately 10 surface acres. Large boulders, limited vegetation, and water depth provide cover for fishes. Water levels are maximum in spring and summer with irrigation overflows and seasonally decrease during the summer.

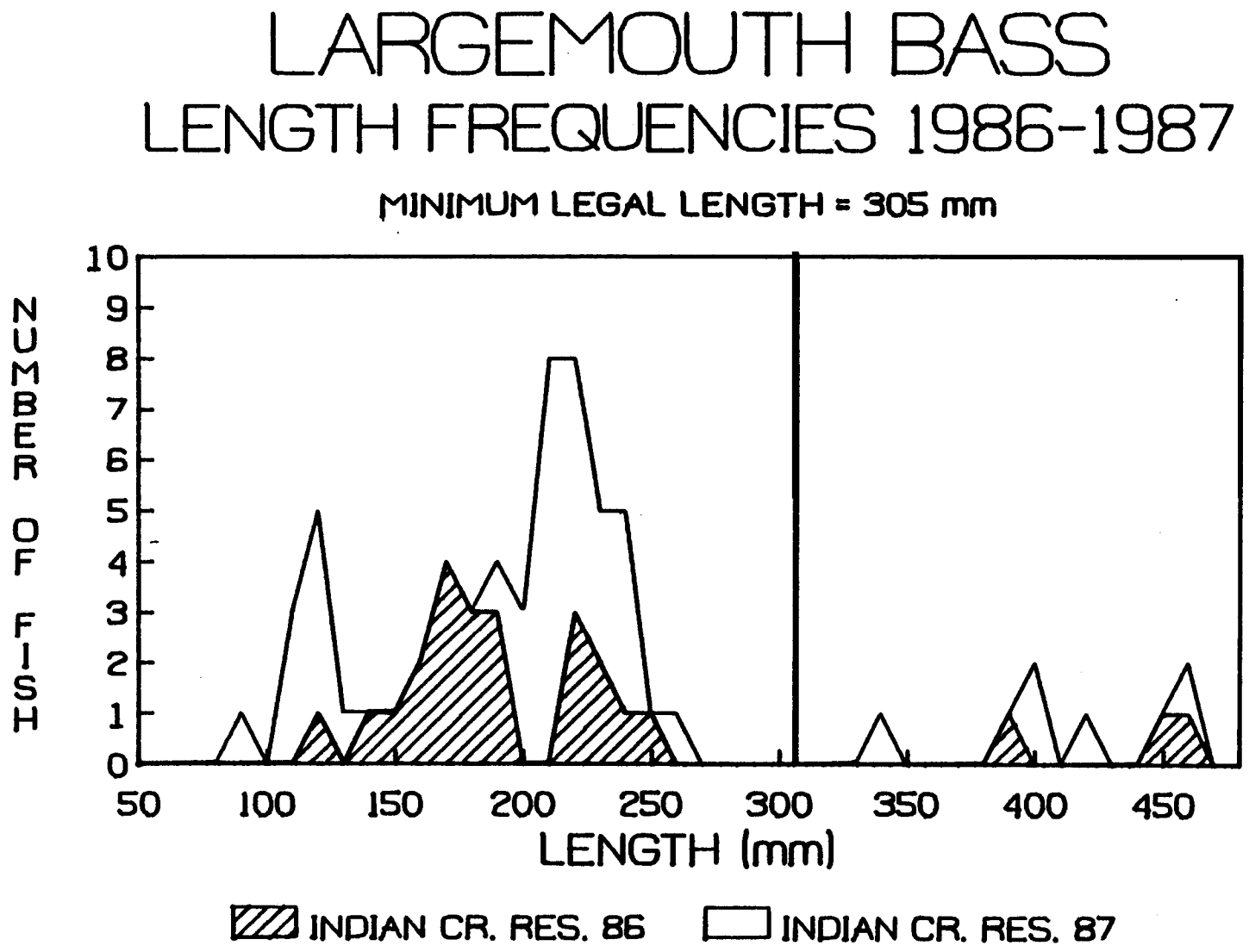


Figure 6. Length frequency of largemouth bass sampled at Indian Creek Reservoir, 1986 and 1987.

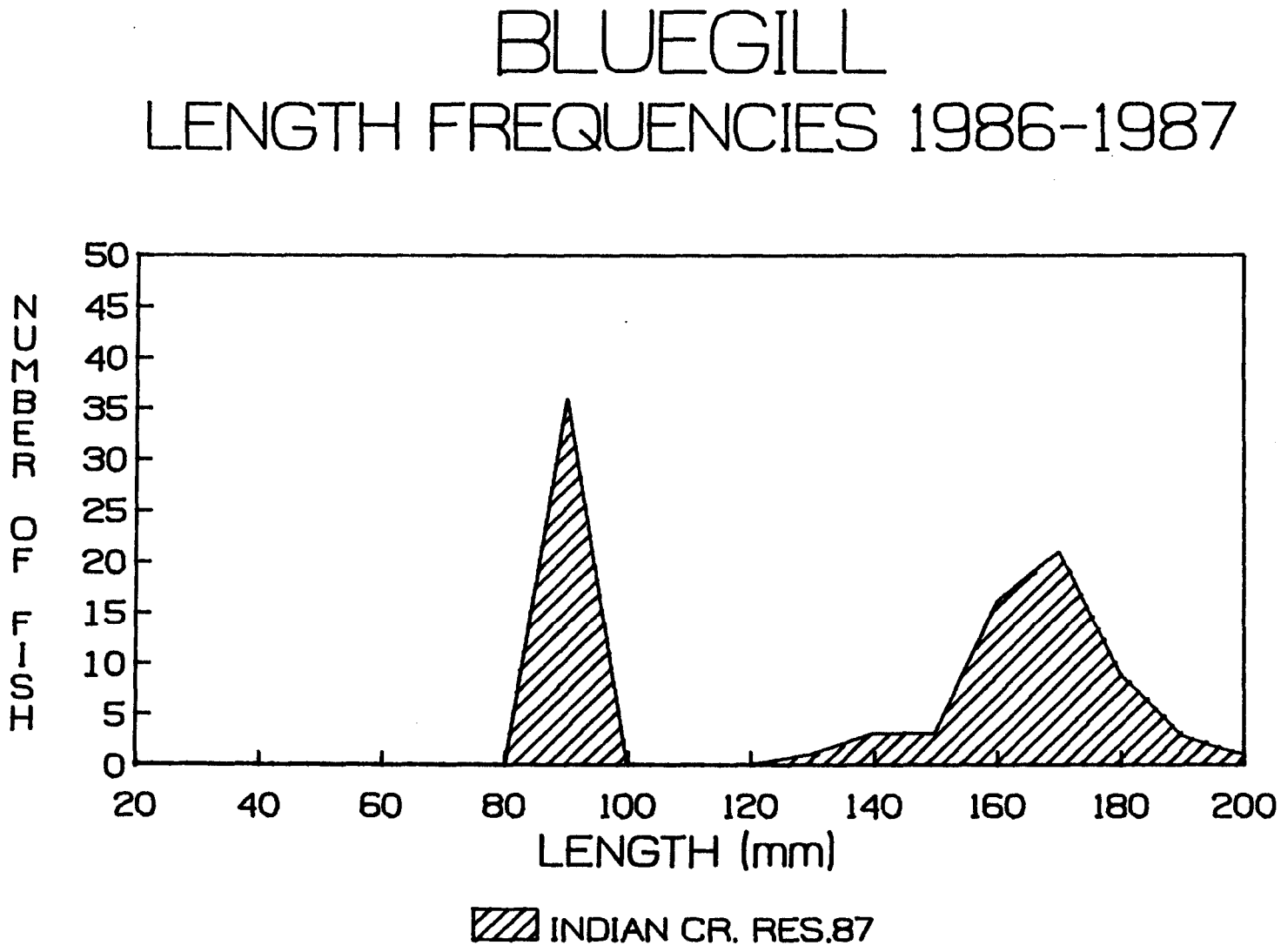


Figure 7. Length frequency of bluegill sampled at Indian Creek Reservoir, 1987.

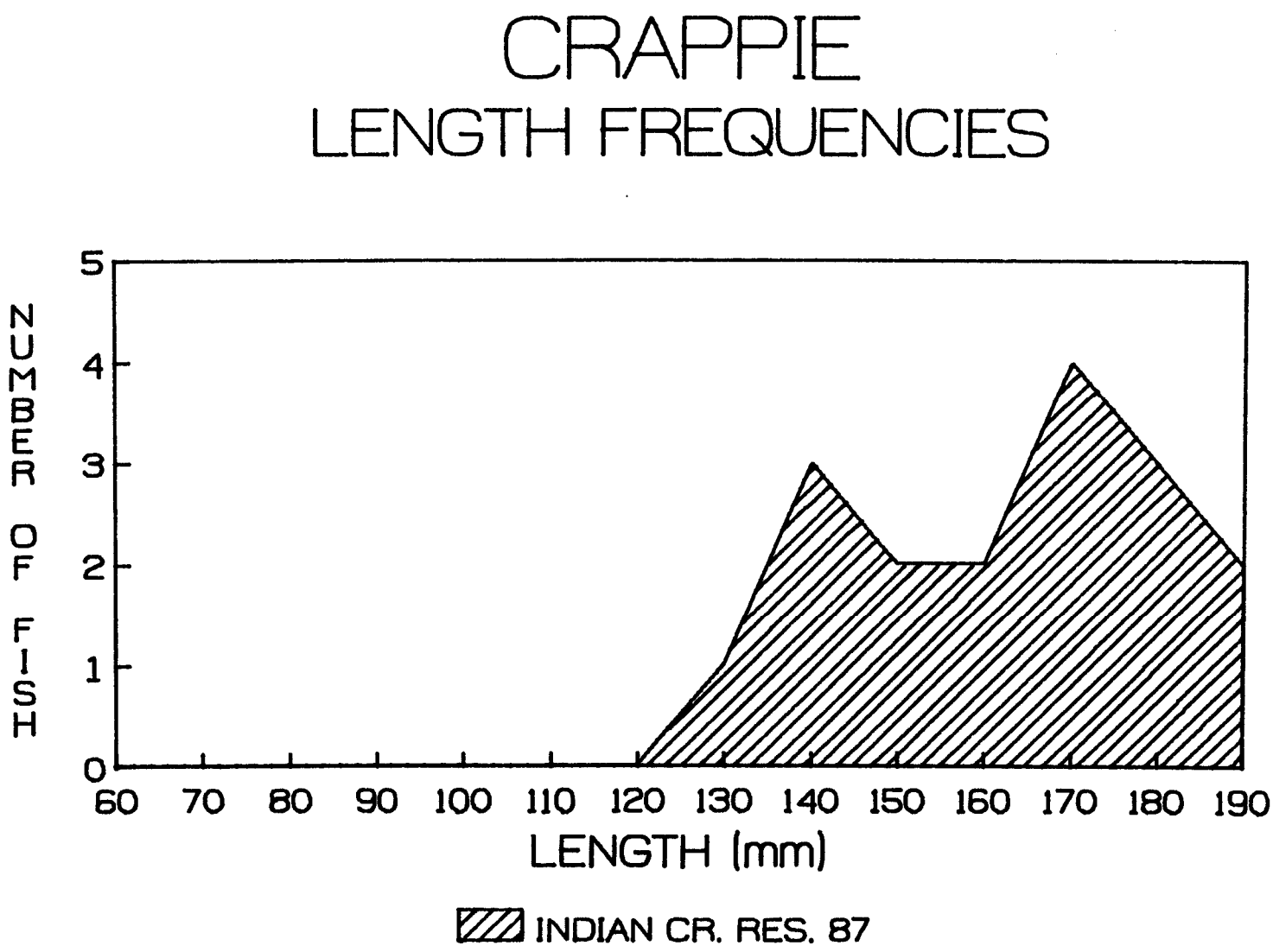
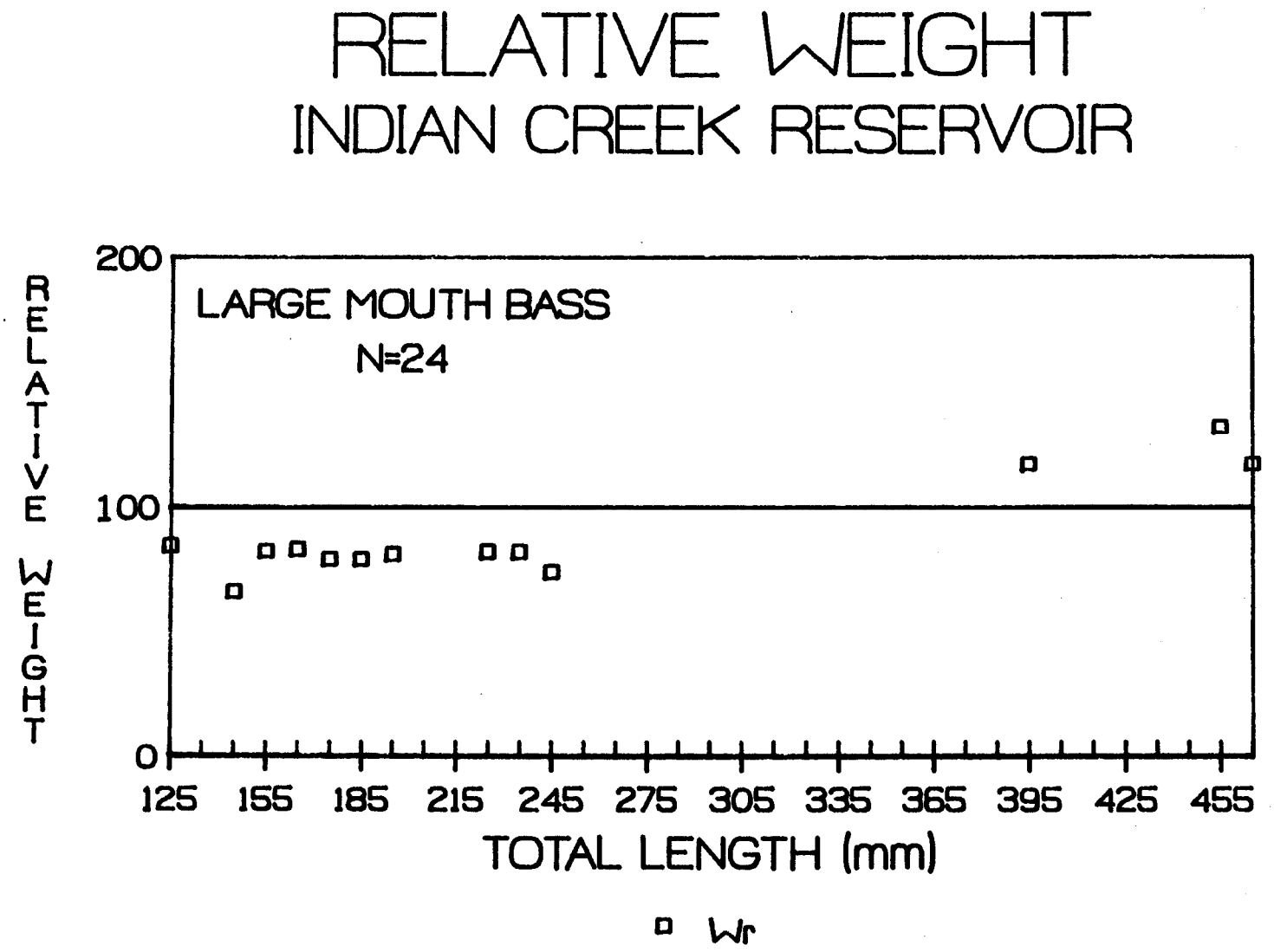
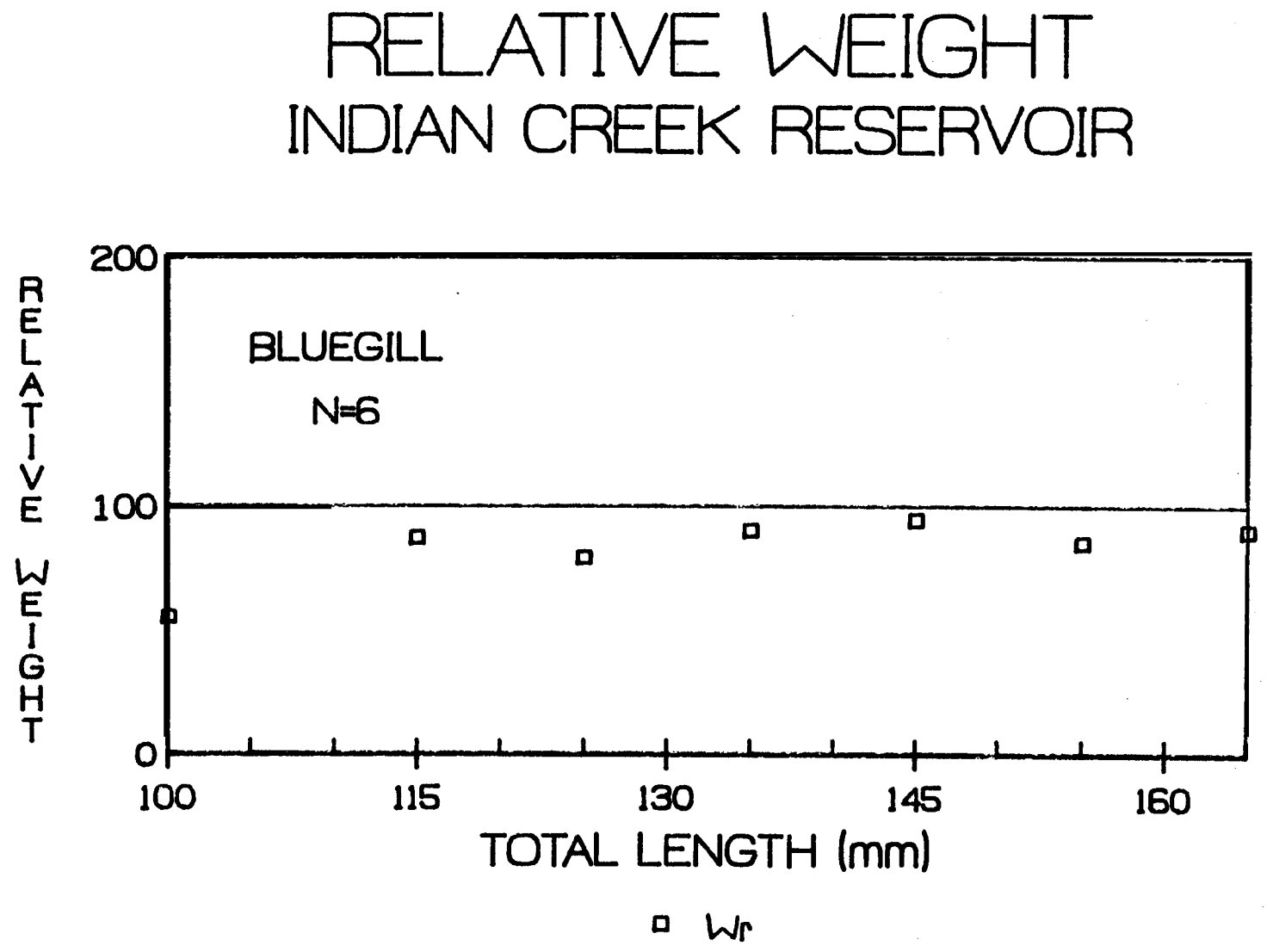


Figure 8. Length frequency of black crappie sampled at Indian Creek Reservoir, 1987.



1986

Figure 9. Relative weight of largemouth bass sampled at Indian Creek Reservoir, 1986.



1986

Figure 10. Relative weight of bluegill sampled at Indian Creek Reservoir, 1986.

Electrofishing in May 1986 sampled 20 largemouth bass and 35 bluegill. The 20 largemouth bass in the sample (Figure 11) had a PSD of 80, indicating poor survival of juvenile bass. Live weights of bass varied from 5 g at 105 mm in total body length to 2,450 g at 485 mm in total body length. Relative weight by size class was near the ideal of 100 (Figure 12), with extremes of 485 mm (Wr=136) and 105 mm (W_r=74) (Figure 12). The mean relative weight was 108 for the sample. Bluegill lengths were 80 to 150 mm with **a** PSD of zero, indicating a stunted population (Figure 13). Relative weights (Figure 14) were well below the ideal and had a mean of 77, further indicating a stunted population.

Channel catfish will be added to Halverson Lake as a predator to reduce the large numbers of stunted bluegill. This introduction will provide large channel catfish and increase the PSDs of bluegill. This reduction of juvenile bluegill should also improve the survival of juvenile bass.

Emmett Airport Pond

Emmett Airport Pond is located in T6N, R2W, S14 and has approximately 13 surface acres. It has a maximum depth of approximately 7 m and has large areas of shallow water. It has minimal shoreline vegetation but has good aquatic vegetation. Water levels appear to remain constant.

Electrofishing in June 1986 sampled 22 largemouth bass, 167 bluegill, (Figures 15 and 16), and 13 pumpkinseed. Largemouth bass had a proportional stock density of 30, indicating a balanced population with some tendency to overharvest older age groups. Live weights of largemouth varied from 20 g at 125 mm in total body length to 390 g at 390 mm in total body length. Relative weight by size class was constantly below the ideal of 100 (Figure 17), with extremes at 305 mm (W_r=78) and 250 mm (W_r=98) (Figure 17). The mean relative weight was 88. The PSD for bluegill was 8, indicating stunting of the population. The W_rs (Figure 18) were below the ideal with a mean of 86, also indicative of stunting.

Channel catfish will be added to the fishery in Emmett Airport Pond to help reduce the large numbers of juvenile bluegill. This introduction should provide large channel catfish and increase the PSDs of bluegill.

Veterans Park Pond

Veterans Park Pond is located in T4N, R2E, S32 and has approximately 14 surface acres. The shorelines generally have vegetation reaching into the water, with some aquatic plants found in the shallow areas. The pond is deep, with some depths to approximately 8 to 9 m. The water level is constant. The Department of Fish and Game currently stocks 500 rainbow trout in Veterans Park in the spring.

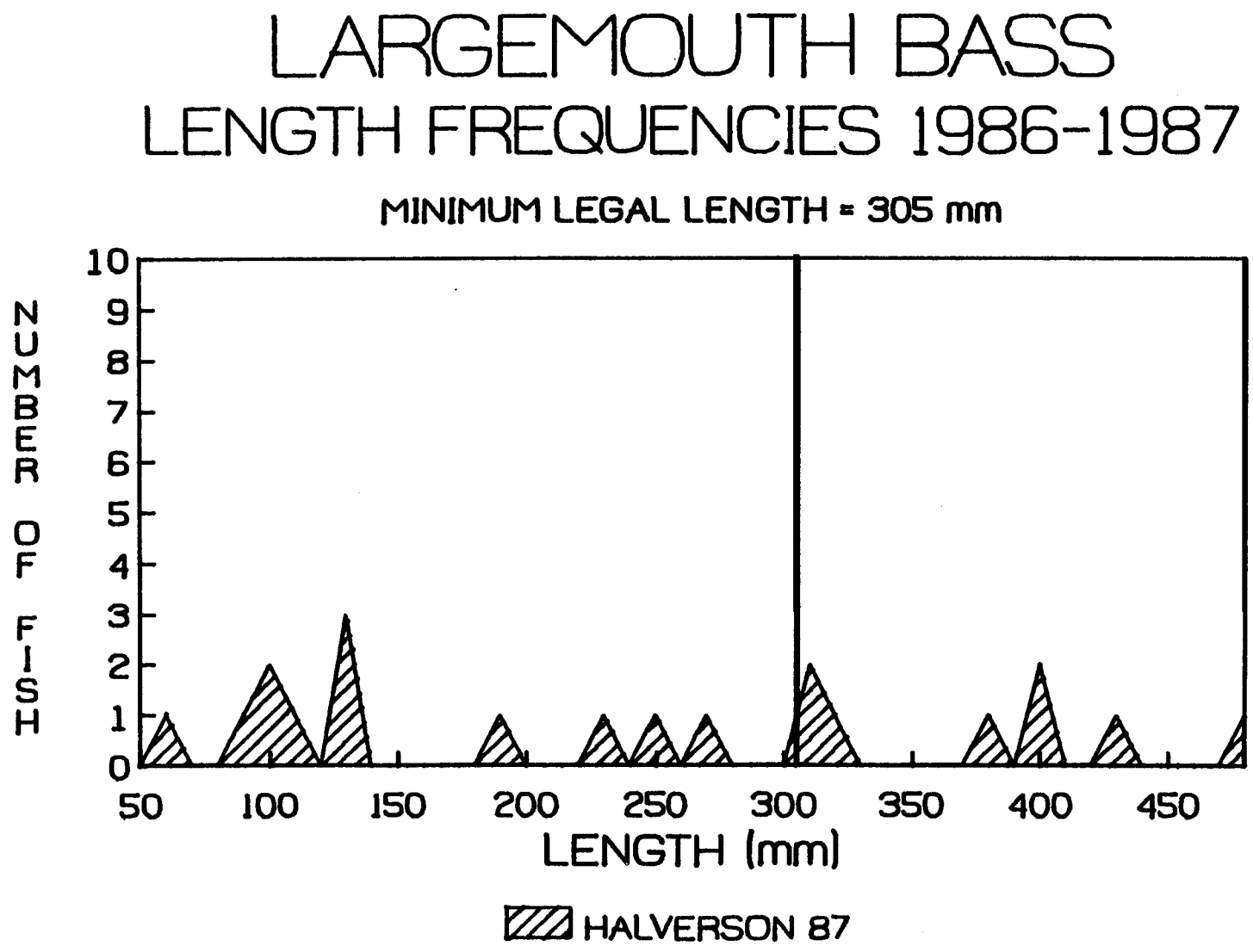


Figure 11. Length frequency of largemouth bass sampled at Halverson Lake, 1987.

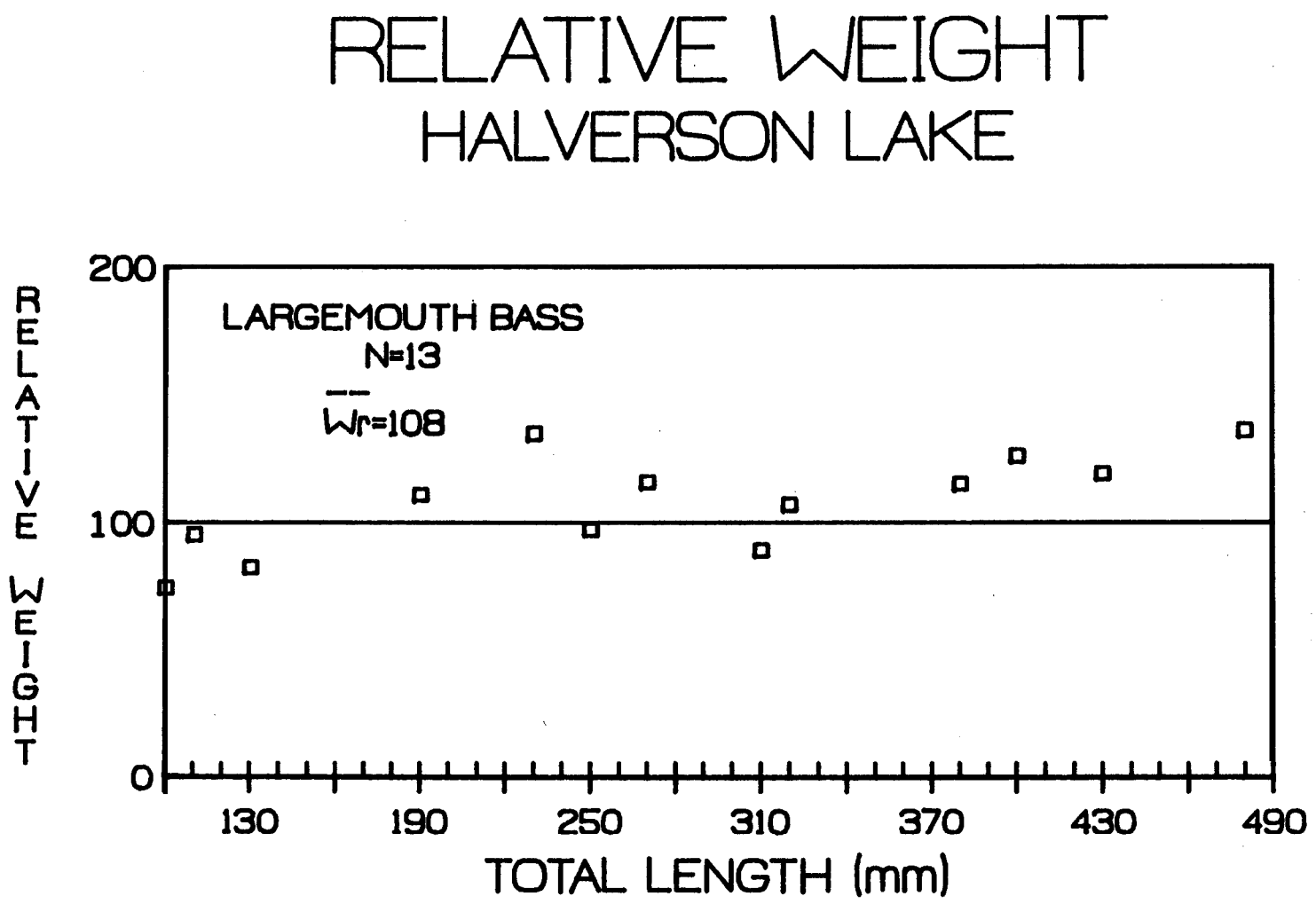


Figure 12. Relative weight of largemouth bass sampled at Halverson Lake, 1987.

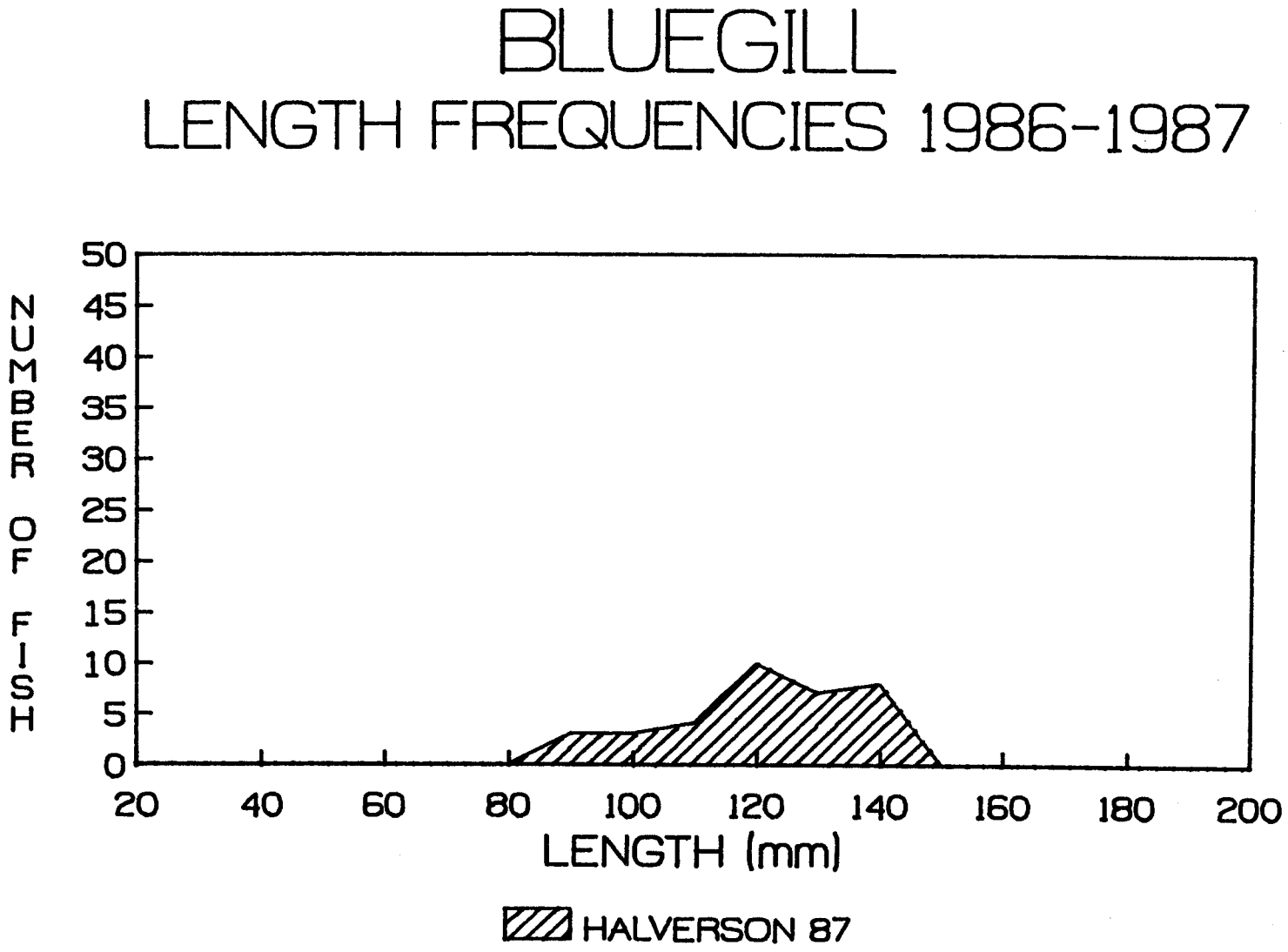


Figure 13. Length frequency of bluegill sampled at Halverson Lake, 1987.

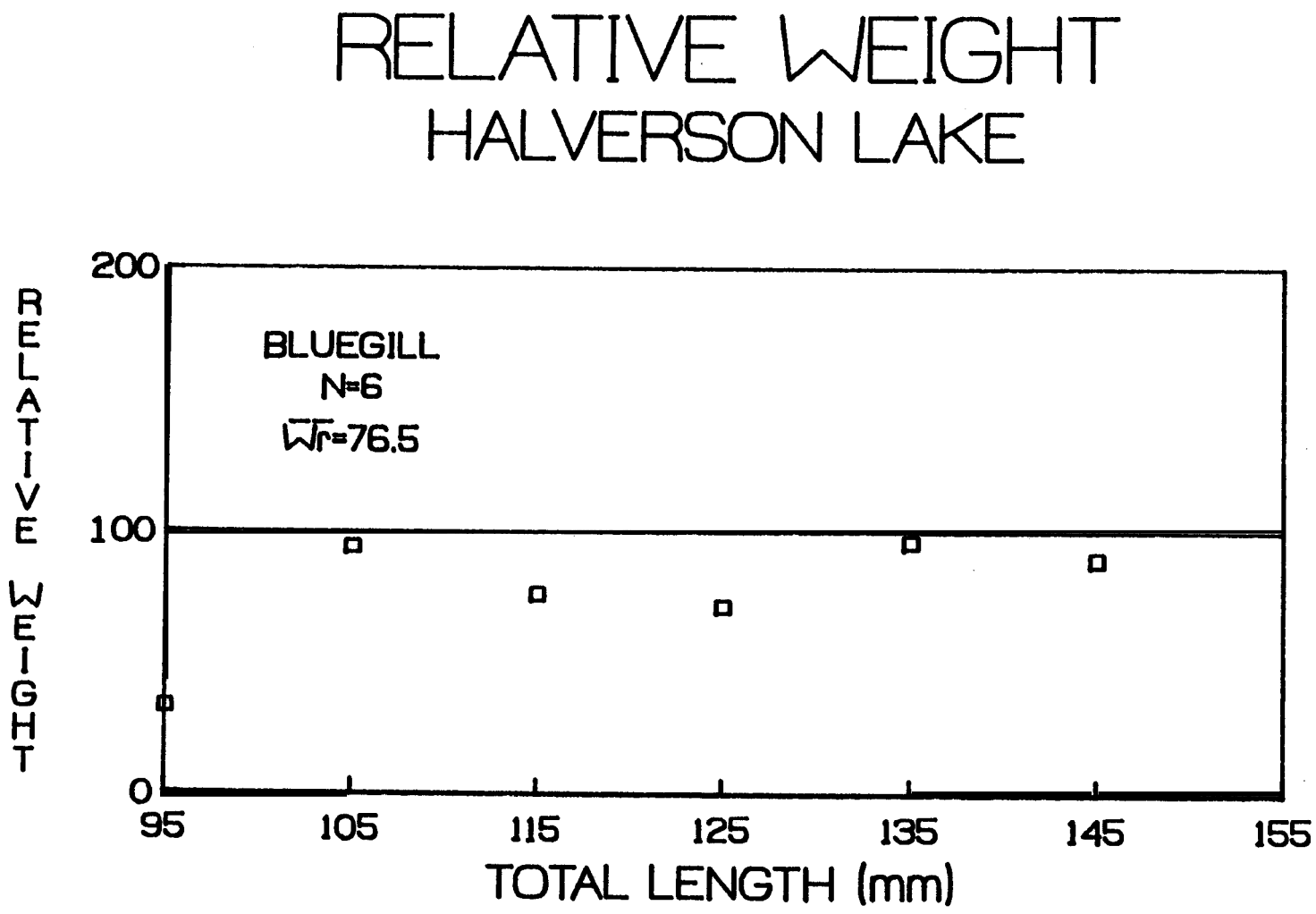


Figure 14. Relative weight of bluegill sampled at Halverson Lake, 1987.

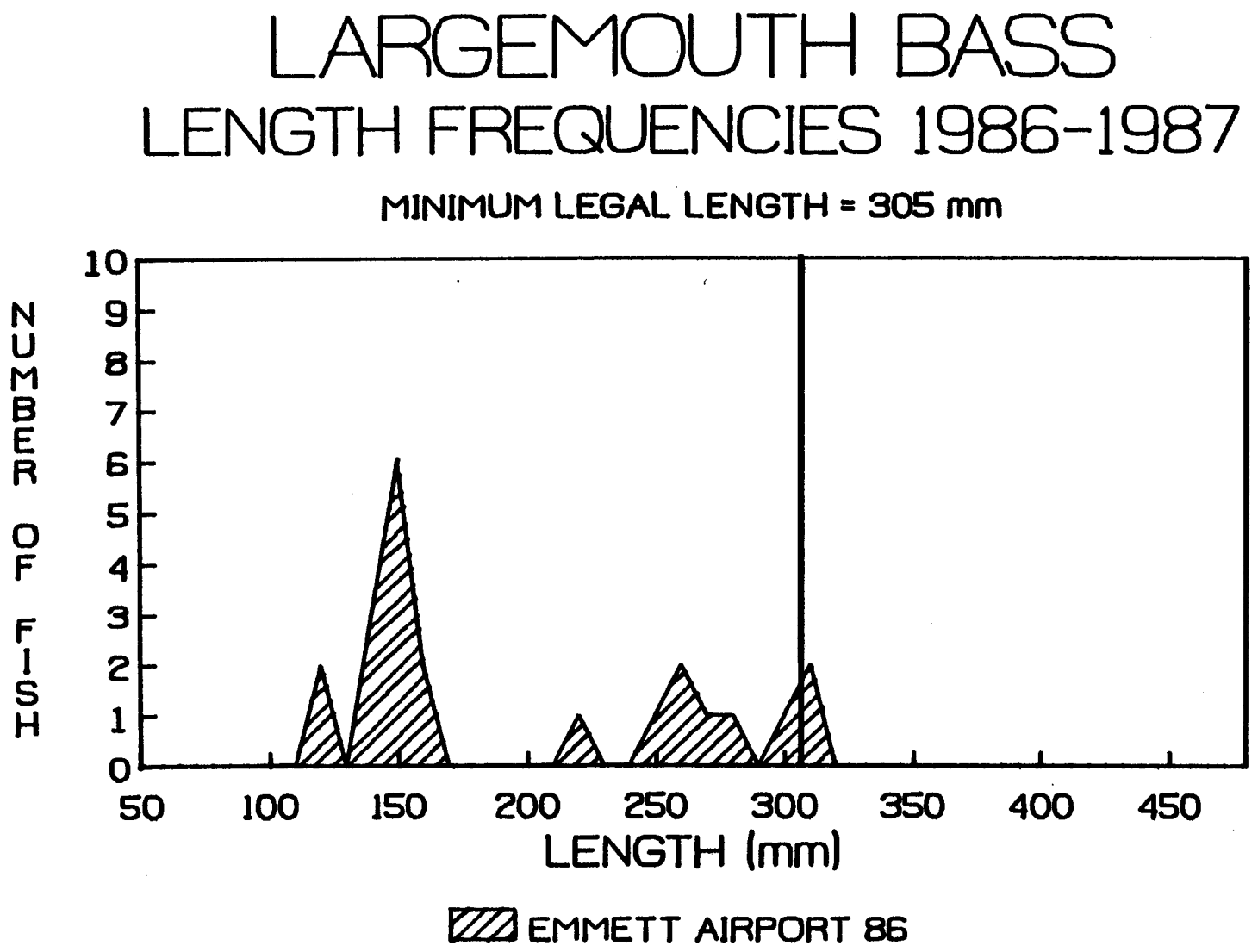


Figure 15. Length frequency of largemouth bass sampled at Emmett Airport Pond, 1986.

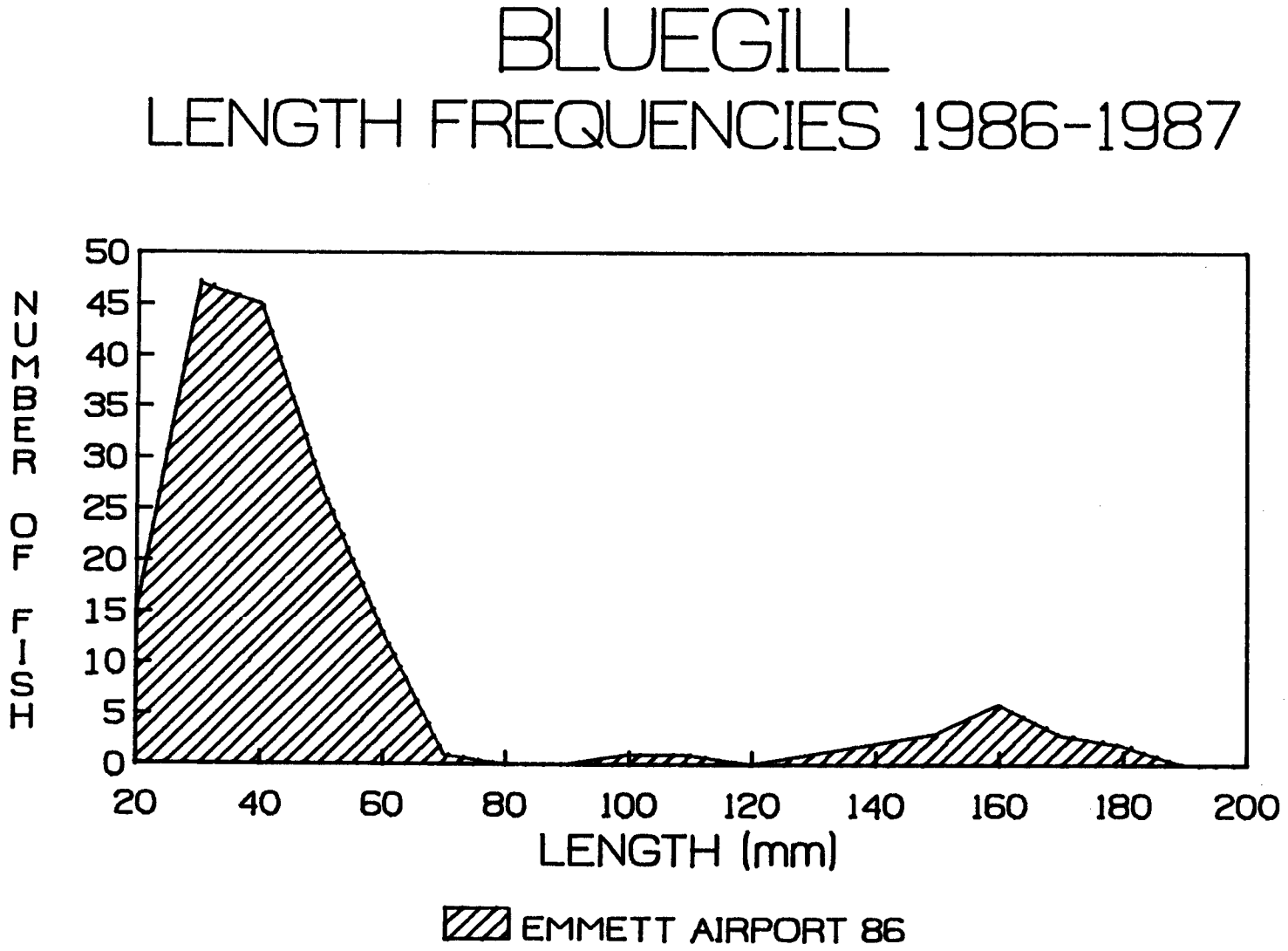


Figure 16. Length frequency of bluegill sampled at Emmett Airport Pond, 1986.

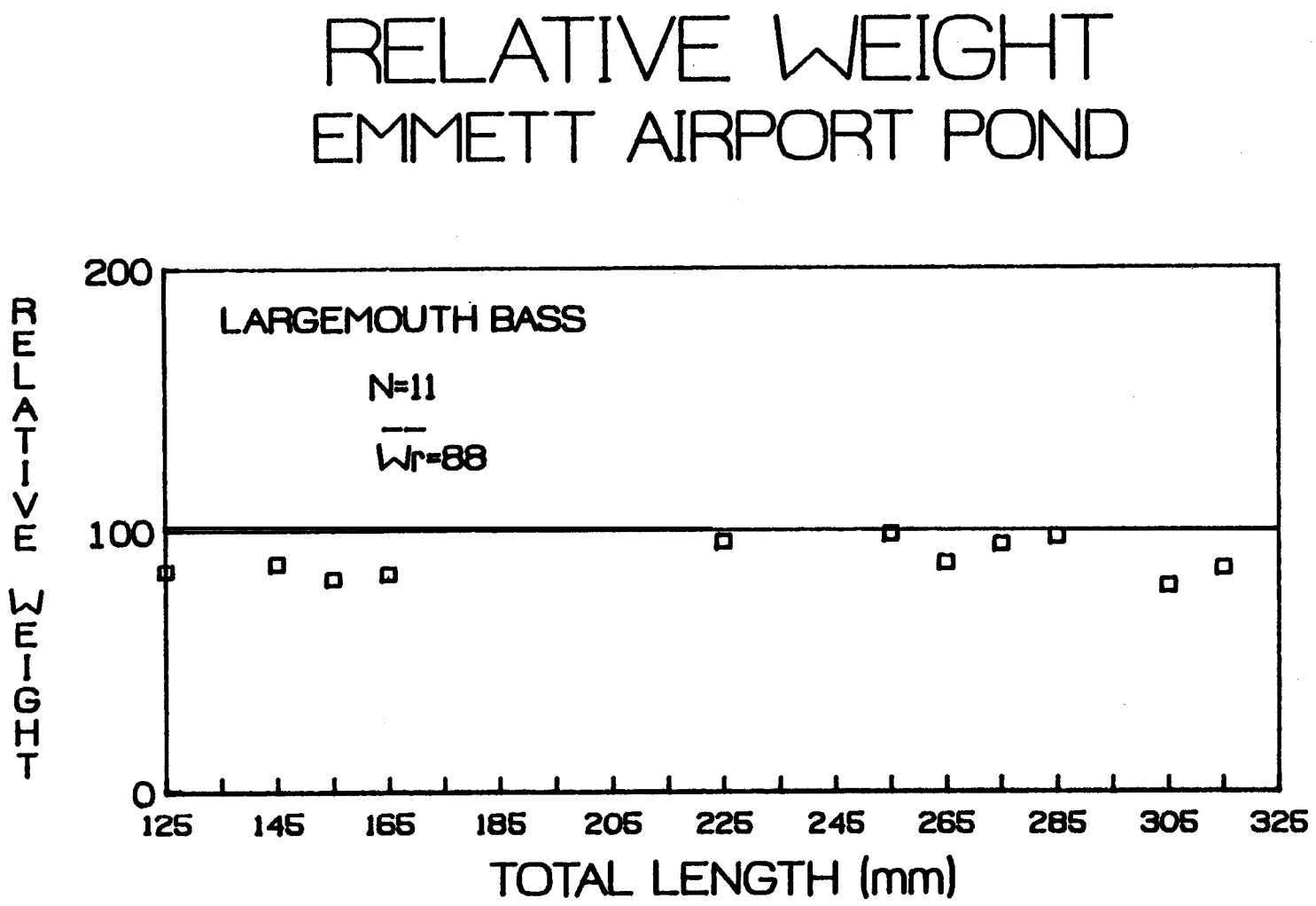


Figure 17. Relative weight of largemouth bass sampled at Emmett Airport Pond, 1986.

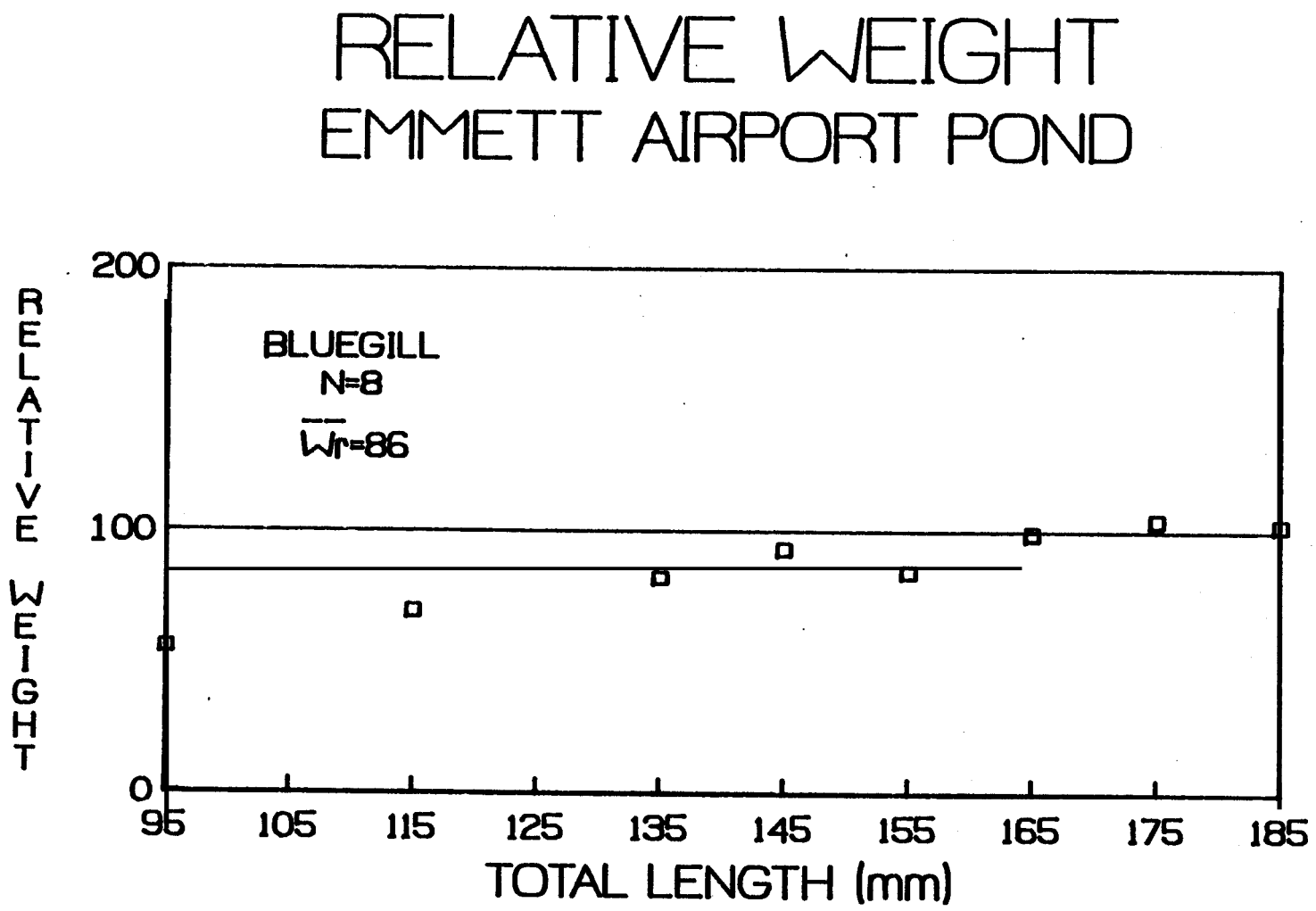


Figure 18. Relative weight of bluegill sampled at Emmett Airport Pond, 1986.

Electrofishing in June 1986 sampled 30 largemouth bass (Figure 19), 5 bluegill (Figure 20), 1 crappie, 16 pumpkinseed, carp, squawfish, redside shiners, chiselmouth, and numerous suckers. The 30 largemouth bass in the sample had a PSD of 14, indicating poor survival of older age groups. This pond receives heavy angler pressure by canoeists, float tubers, and bank anglers. Live weights of bass varied from 10 g at 120 mm of total body length to 480 g at 315 mm of total body length. Relative weight by size class was generally well below the ideal of 100 (Figure 21), with extremes of 145 mm (Wr=33) and 315 mm (W_r=106) (Figure 21). The mean relative weight was 73 for the sample. The PSDs for bluegill were not calculated due to the small sample size. W_rs for bluegill (Figure 22) were near the ideal and had a mean of 99, indicating a healthy population.

Four hundred Christmas trees were added to Veterans Park in 1987 to evaluate their effectiveness as fish nursery habitat. Sampling in 1987 found large numbers of juvenile bass (30 to 50 mm) occupying the tree structure area, indicating successful spawning, survival, and occupation of bass.

We will increase numbers and frequency of stocking of hatchery catchables to meet the heavy angling pressure.

Caldwell Ponds

The two Caldwell ponds are located in T4N, R3W, S16 and have approximately 15 surface acres. The ponds have depths to 5 m but generally range between 2 to 3 m. The water level is constant, with habitat of extensive shoreline vegetation with some undercut bank. Mid- to late summer finds aquatic vegetation in 60% to 70% of the ponds. The Department currently stocks 5,000 hatchery catchables between March and June each year.

Electrofishing in June 1986 sampled six largemouth bass, ranging in size from 95 to 270 mm in total body length (Figure 23). Proportional stock density was not calculated due to the small sample. Relative weights for five bass was generally near the ideal of 100 (Figure 24), with a mean of 85. One school of small bluegill (15 to 25 mm) was found, but the intensity of angling pressure at these ponds keeps the bluegill population reduced.

The Caldwell ponds are an excellent example of a "put-and-take" hatchery fishery. Angling pressure is heavy and dependent upon the Department's fish stocking schedule. Two things need to be done to improve this fishery. The first will be to increase the number and frequency of stocking of hatchery catchables. This will increase angler success and decrease the fluctuations in catch rates. The second solution to improving this fishery is to find other public fishing waters in the nearby vicinity for anglers. . There are several gravel ponds in the immediate area that would, if anglers were permitted access, reduce pressure at the Caldwell ponds. Efforts will be made to secure access for anglers and improve the angling experience in the Caldwell Pond vicinity.

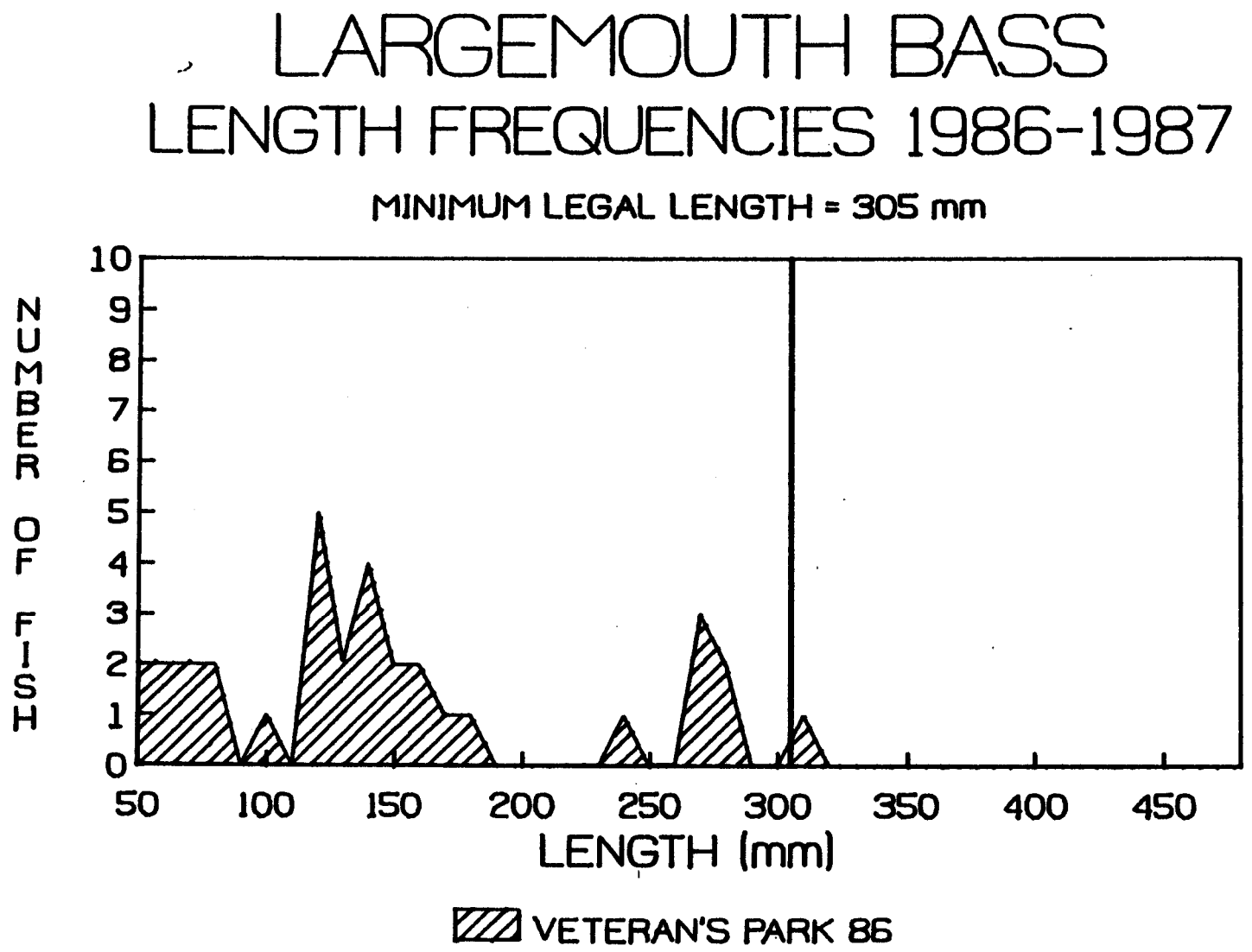


Figure 19. Length frequency of largemouth bass sampled at Veterans Park Pond, 1986.

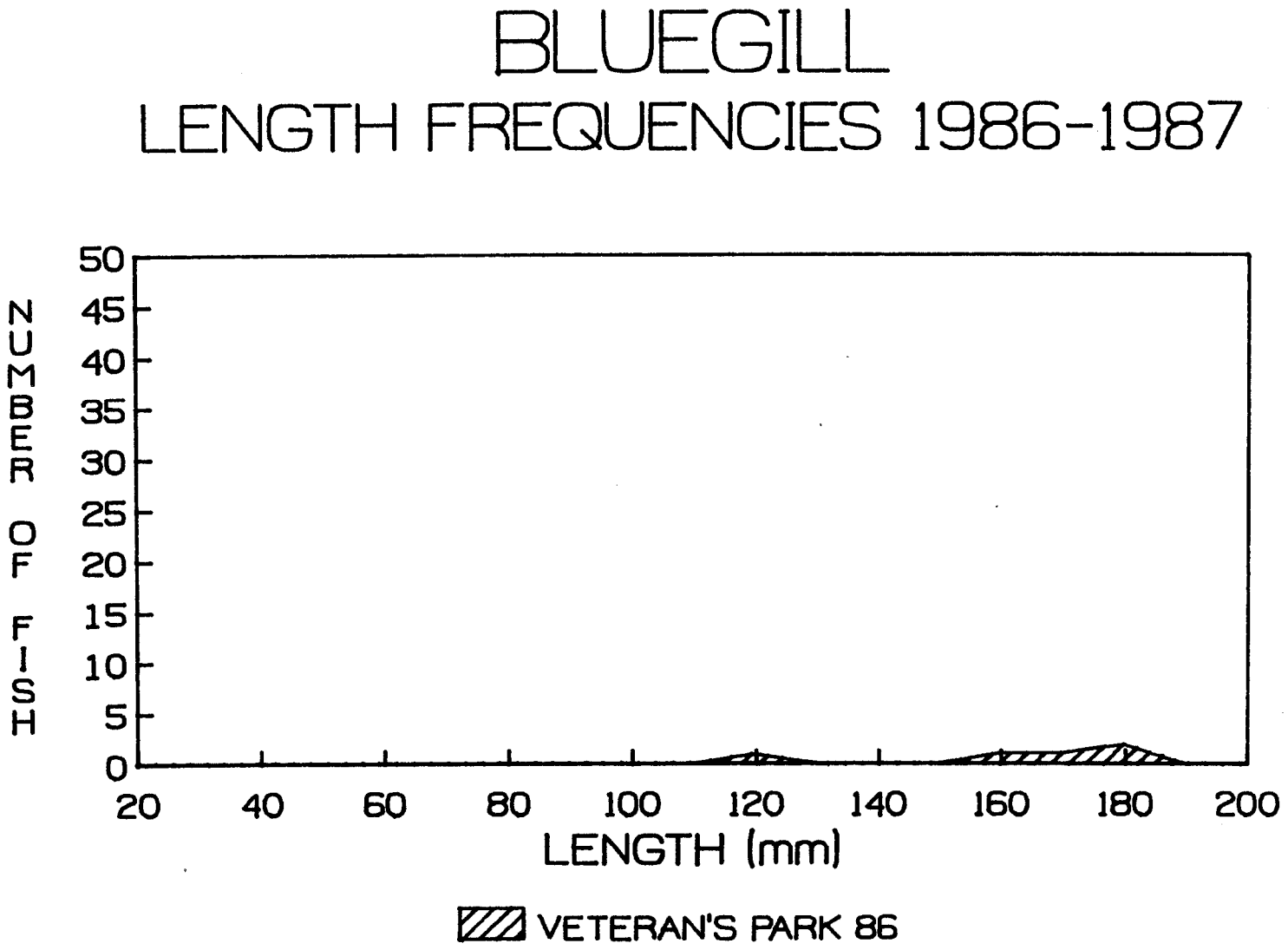
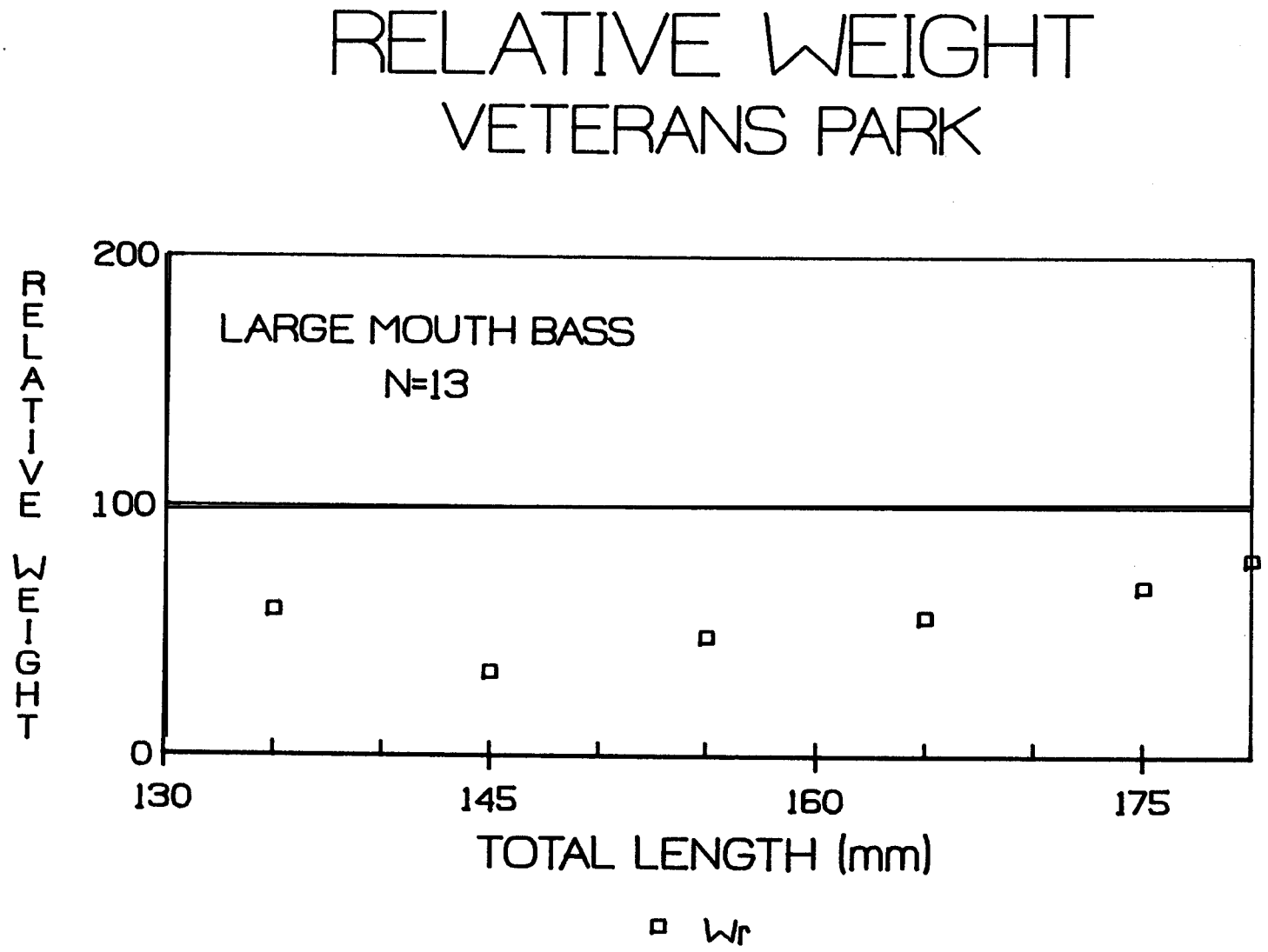
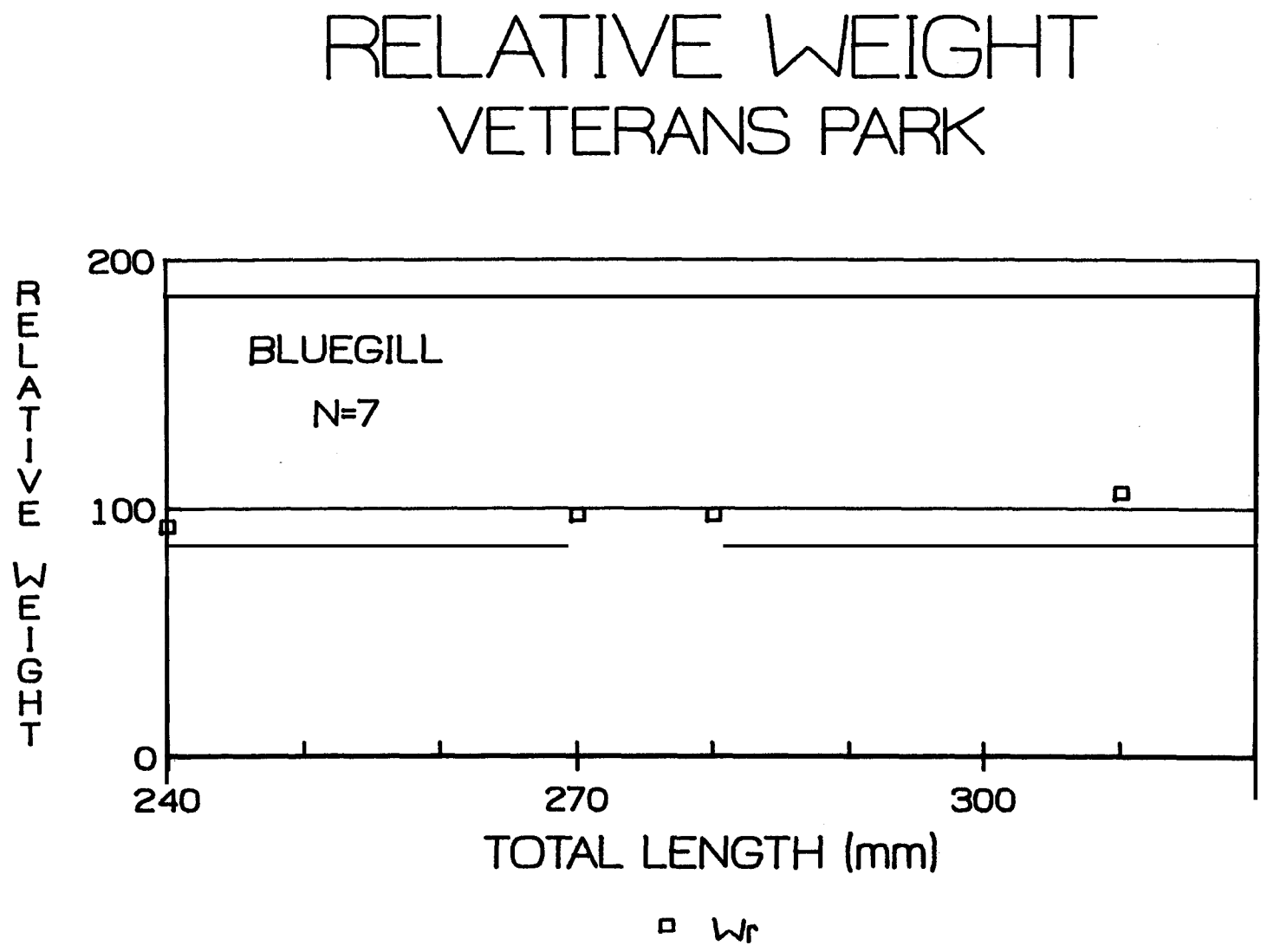


Figure 20. Length frequency of bluegill sampled at Veterans Park Pond, 1986.



1986

Figure 21. Relative weight of largemouth bass sampled at Veterans Park Pond, 1986.



1986

Figure 22. Relative weight of bluegill sampled at Veterans Park Pond, 1986.

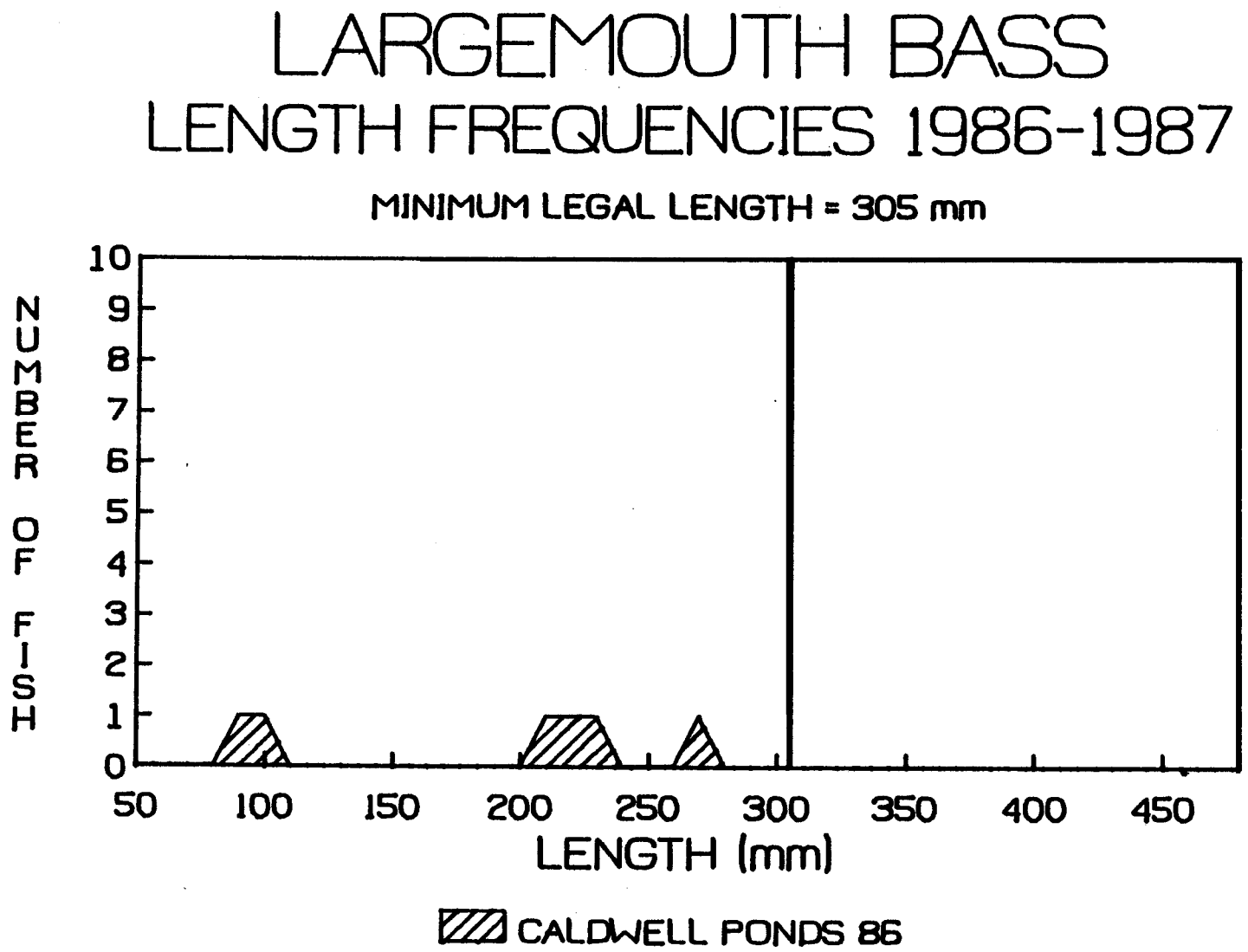
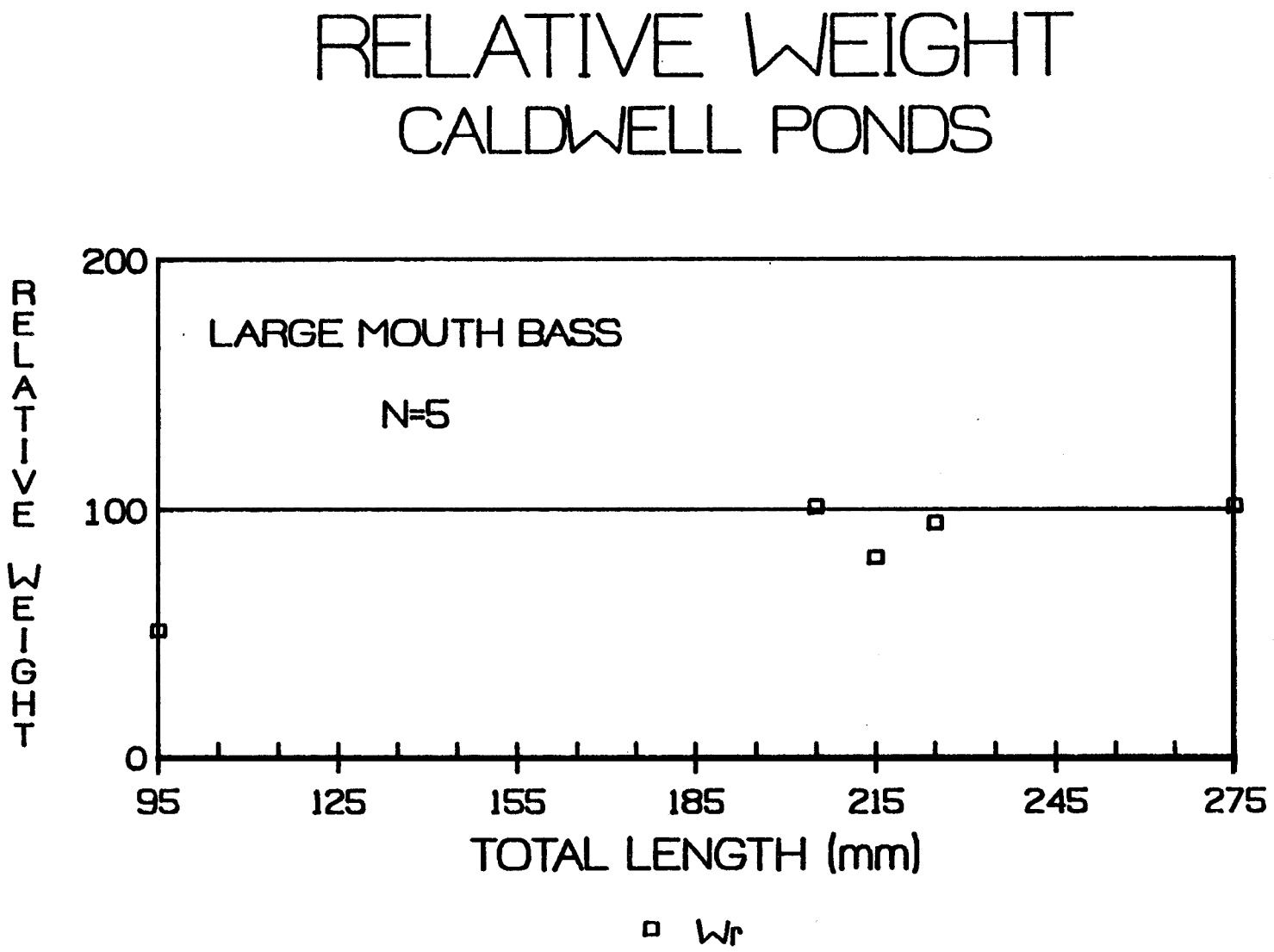


Figure 23. Length frequency of largemouth bass sampled at Caldwell Pond, 1986.



1986

T9AD1 Figure 24. Relative weight of largemouth bass sampled at Caldwell Pond, 1986.

Habitat Enhancement

Trees, tires, and stumps were placed on the ice at Lake Lowell in January 1987 (Table 1). Habitat structure designs were similar to those in 1986 (Reid 1987). The structures were located on the ice near areas where structures were placed in 1986.

Volunteers constructed tree structures on the ice near Cottonwood Campground at C.J. Strike Reservoir. Structures were placed over water 1 to 2 m deep, and most structures sunk through the ice in the planned area. The placement of these structures was for fish nursery habitat for juvenile warmwater fish.

Volunteers placed 320 trees at water's edge at Indian Creek Reservoir. These structures were designed in circular shapes, with the weights and butt ends of the trees secured at the center. Due to low water conditions in 1987, the Indian Creek structures were never covered with water but became excellent quail habitat.

Christmas trees (1,200) were placed in **a** shallow area of Veterans Park for a fish nursery area. The trees were located in 0 to 1.5 m of water and placed in an area that appeared to be good for rearing young warmwater fish.

Using electrofishing equipment in September 1987, we found significant differences in fish densities between areas with structures and areas without structures (Table 2). Low water during September allowed sampling of structures at Lake Lowell. During normal summers, these structures would, even during low water periods, remain in 2 to 5 m of water. The structures at C.J. Strike Reservoir are located in a constant water depth of 1 to 2 m.

Densities of largemouth bass and bluegill were higher in structured areas than natural shorelines in nearly all samples (Figures 25 to 27). Total densities of largemouth bass in Lake Lowell were greater in tire structures than other structured or nonstructured **areas.** When water was lowest, September 24, the tree stumps at Lake Lowell held the highest densities of largemouth bass greater than 305 mm (0.44 bass/m). Tire structures also held the highest densities of bluegill greater than 130 mm (1.31 bluegill/m). Both tire and tree stump structures are proving good adult black bass and bluegill habitat. They also are providing a nursery habitat for juvenile warmwater fish during low water.

C.J. Strike had the highest total sampled densities of largemouth bass, 1.08 bass/m, in Christmas tree structures (Figure 28). Christmas tree structures at C.J. Strike Reservoir also held large numbers of juvenile crappie. Only **a** small portion of the crappie observed were collected in the sample. Correspondence with Department personnel (Orcutt, personal communication) indicated that crappie spawning occurred in the tree-structured area for the first time in 1987. The structures are currently meeting their objective as good nursery habitat for juvenile warmwater fish.

Table 1. Summary of fish habitat structures, 1987.

Date	Water	Materials	Number of	Voluntee
Jan 21-27	Lake Lowell	600 trees[a] 800 car tires 800 tree stumps[b]	88	506
Jan 31-Feb 7	C.J. Strike Res.	1,800 trees	51	320
Feb 14	Indian Cr. Res.	320 trees	11	40
Feb 21-Mar 28	Veterans Park	1,200 trees	12	56

[a]Cut Christmas trees without flocking or tinsel.
[b]Apple tree stumps.

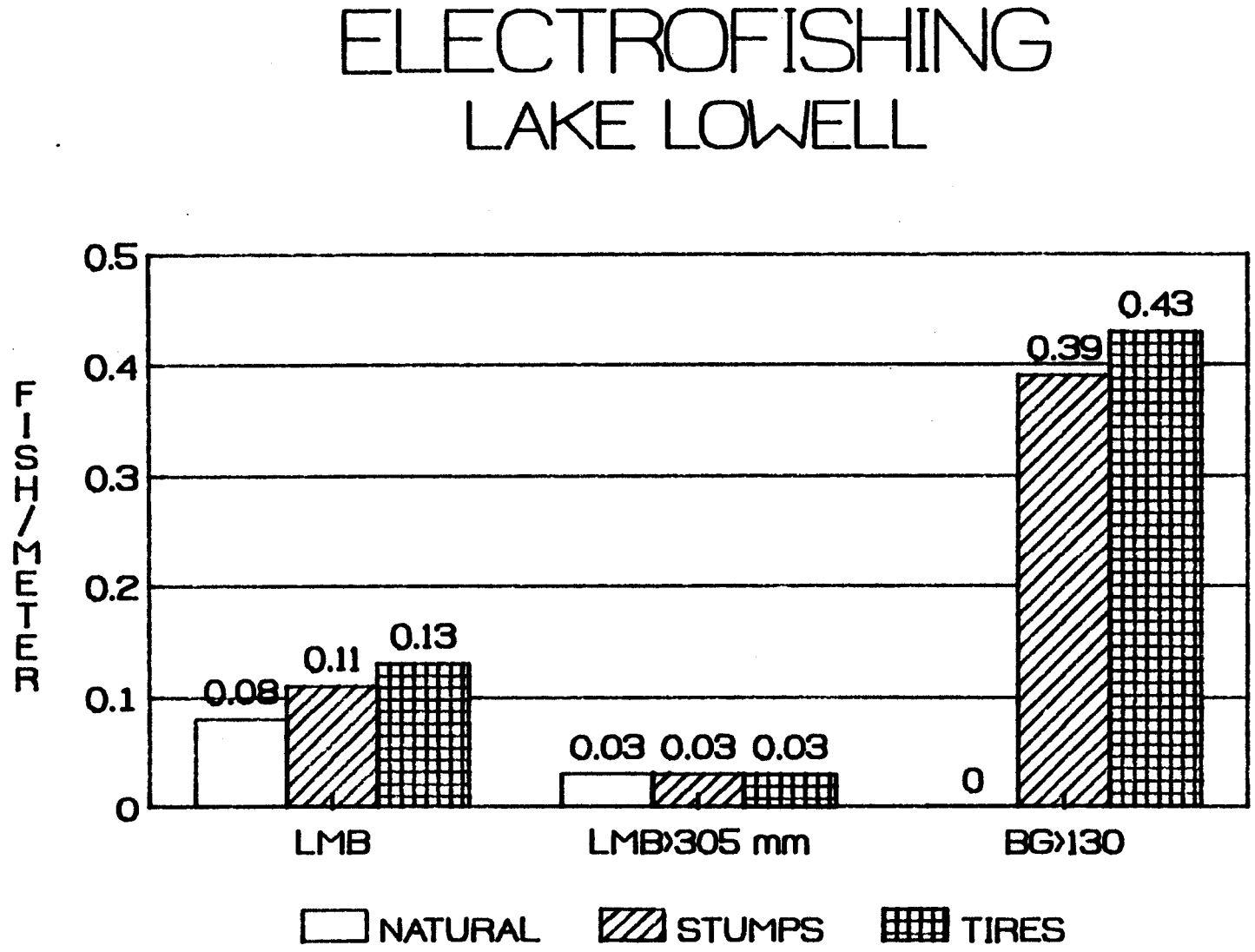
Table 2. Electrofishing data from fish[a] collected in Lake Lowell, C.J. Strike Reservoir, and Veterans Park Pond in September, 1987.

Date	Structure	Water depth (m) Max	Water depth (m) Min	Distance sampled (m)	Time sampled (min)	LmB Tot	LmB /m	LmB >305	LmB >305 /m	Bg Tot	Bg >130	Bg >130 /m	Bg SmB	PS	Tot Cr	Cr >200	Suck	Tot YP
Lake Lowell																		
9/3/87	Stumps	2	1	75	9.15	8	.11	2	.03	44	29	.39	1	0	3	1	0	0
9/3/87	Tires	1.5	1	30	5.00	4	.13	1	.03	42	13	.43	0	0	0	0	0	0
9/3/87	Natural Shoreline	2	1	300	14.15	25	.08	9	.03	45	0	0	0	4	-	-	-	13
9/11/87	Stumps	2	1	100	22	24	.24	8	.08	147	62	.62	2	1	2	2	1	1
9/11/87	Tires	1.5	1	30	8	29	.97	10	.33	92	26	.87	3	-	-	-	-	3
9/11/87	Natural Shoreline	2	1	175	20	20	.11	1	.01	144	0	0	2	3	-	-	1	10
9/24/87	Stumps	2	1	34	12.0	21	.62	15	.44	20	10	.29	2		3	3		
9/24/87	Tires	1.5	1	16	12.0	17	1.06	1	.06	105	21	1.31	14					
9/24/87	Natural Shoreline	2	1	150	24	12	.08	1	.01	252	5	.03	4				4	2
C.J. Strike																		
9/21/87	Christmas Trees	2	1	50	30	54	1.08	15	.30	43	3	.06	2	3	261	4	32	45
9/21/87	Natural Shoreline	2	.3	370	20	23	.06	1	.00	25	7	.02	2	3	1	0	2	4
Veterans Park Pond																		
7/13/87	Christmas Trees	2	.2	30	12	6[a]	.20	0	0	2	2	.07	0	4				1
7/13/87	Natural Shoreline	3	.2	200	25	3[b]	.02	0	0	0	0	0	0					

[a]Estimated 250 juvenile bass observed.

[b]Estimated 30 juvenile bass observed.

LmB = largemouth bass
SmB = smallmouth bass
PS = pumpkinseed
Bg = bluegill
Cr = crappie
Suck = suckers
YP = yellow perch



9/03/87

Figure 25. Densities of largemouth bass and bluegill sampled in structures and natural shorelines at Lake Lowell, 3 September 1987.

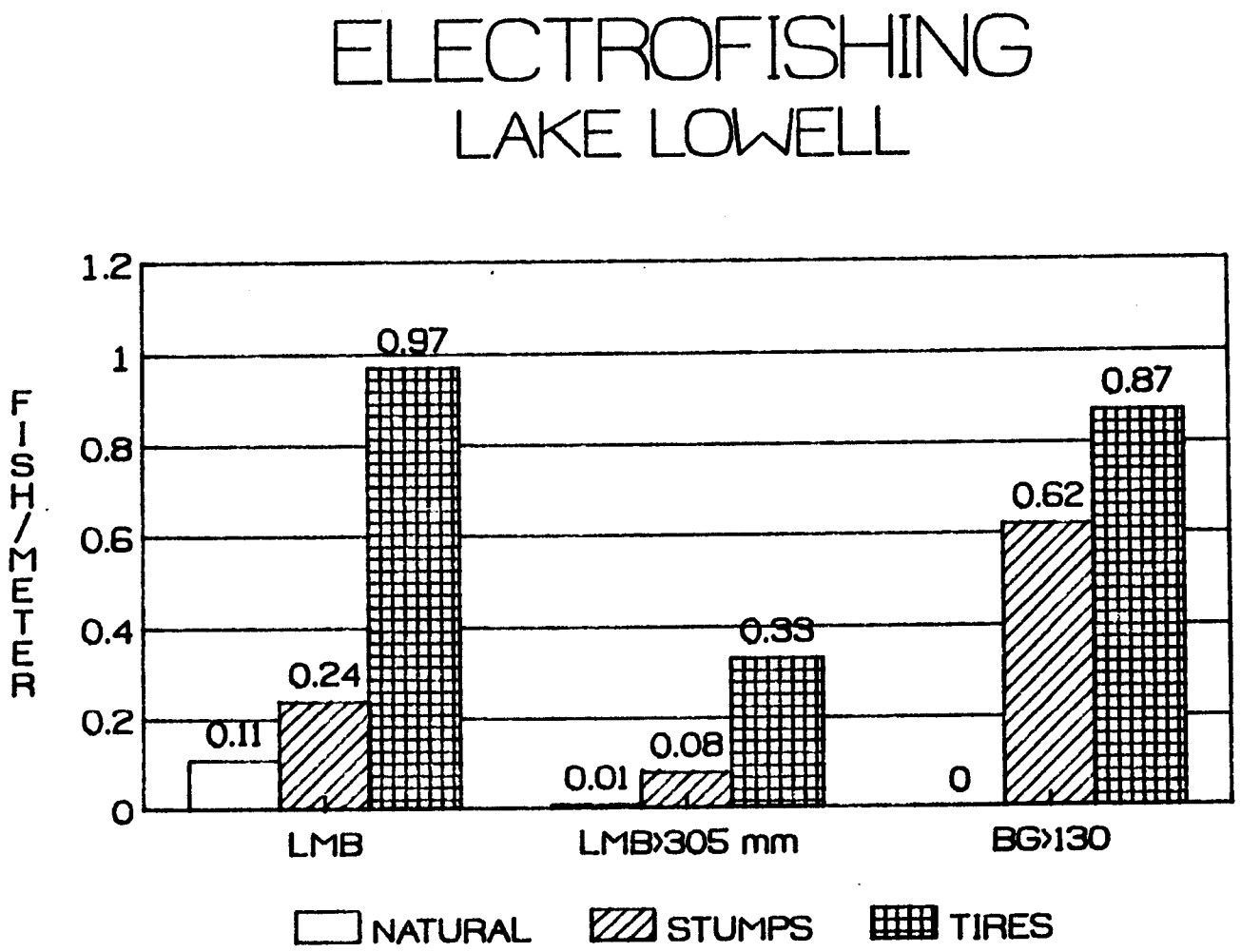


Figure 26. Densities of largemouth bass and bluegill sampled in structures and natural shorelines at Lake Lowell, 11 September 1987.

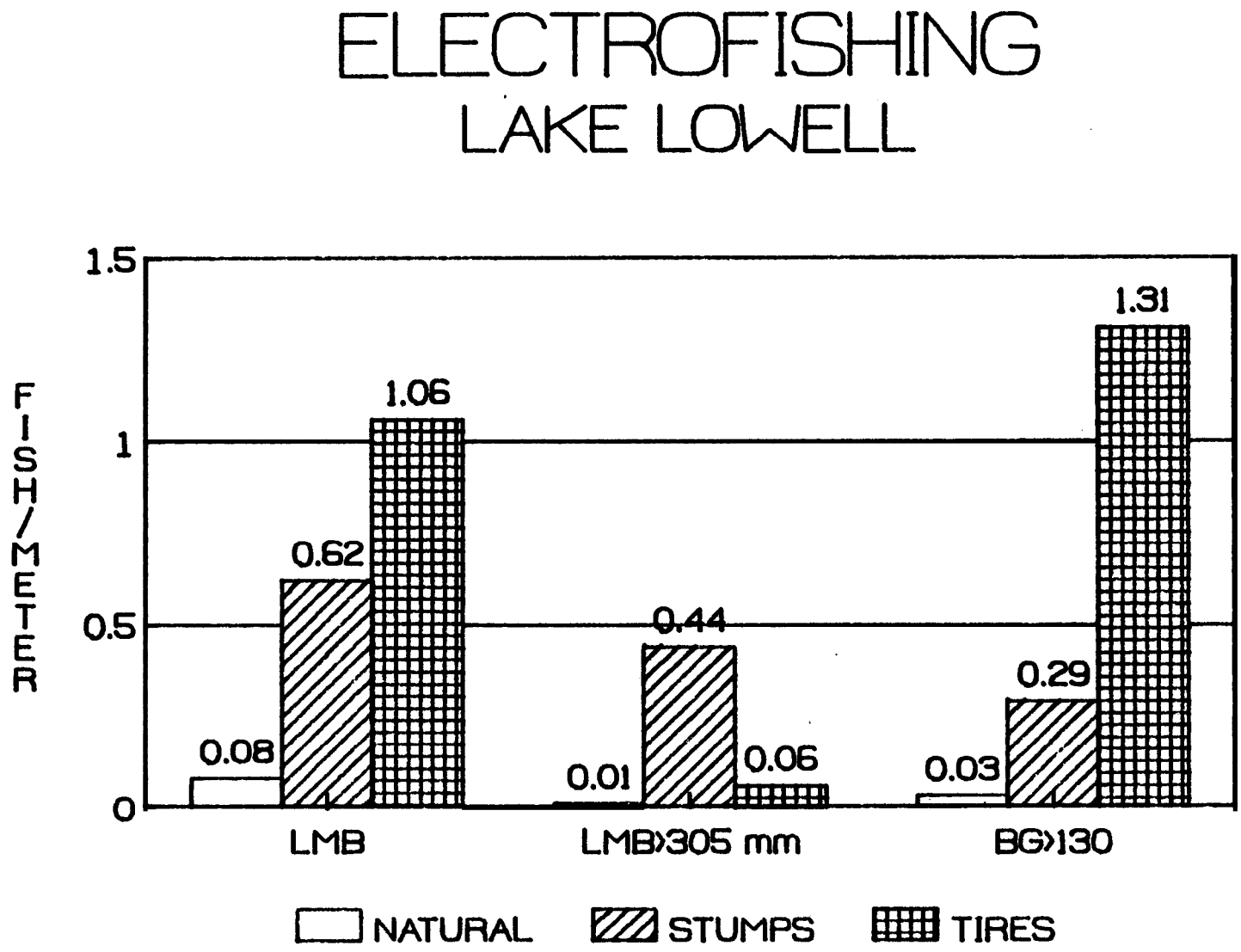


Figure 27. Densities of largemouth bass and bluegill sampled in structures and natural shorelines at Lake Lowell, 24 September 1987.

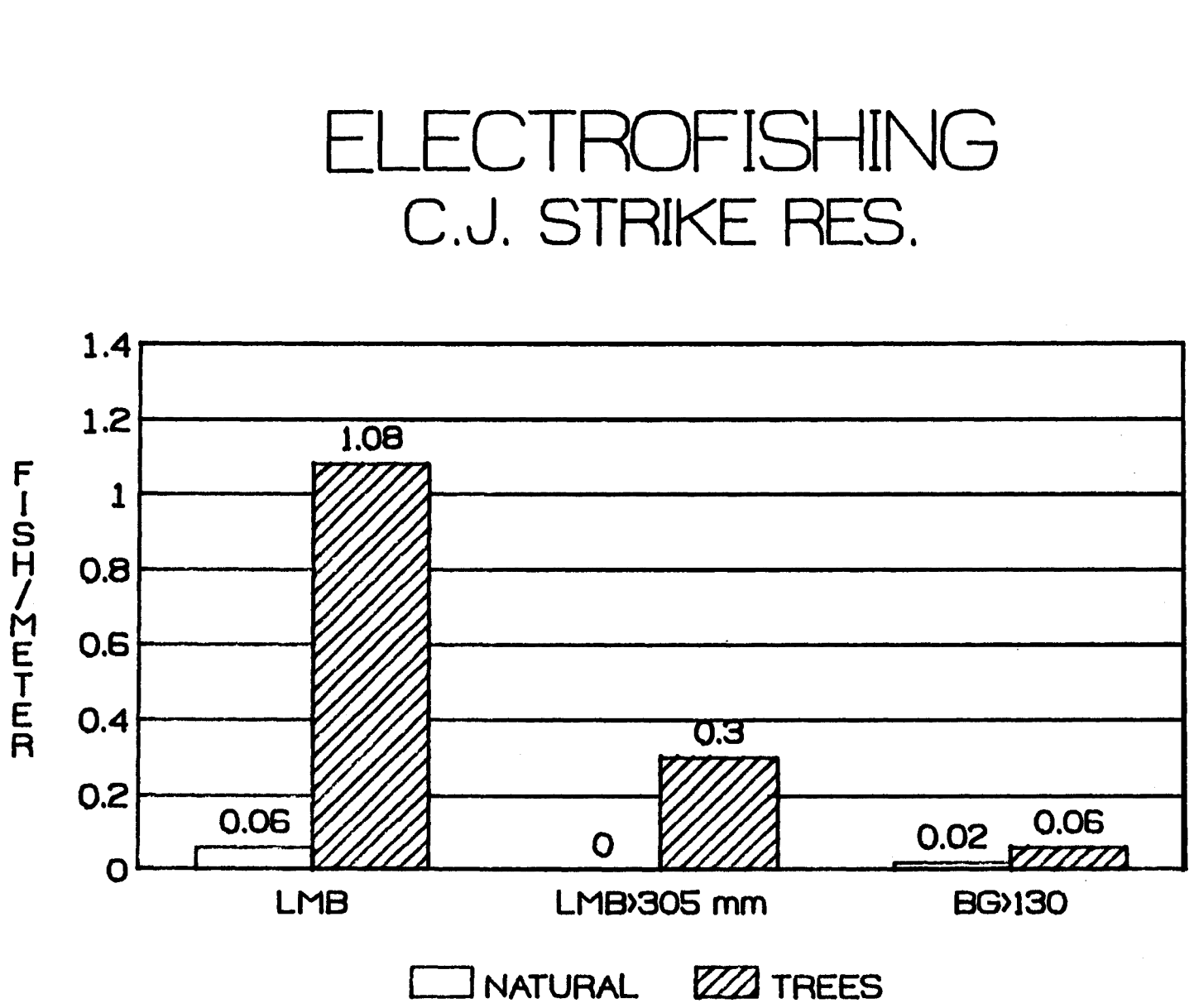


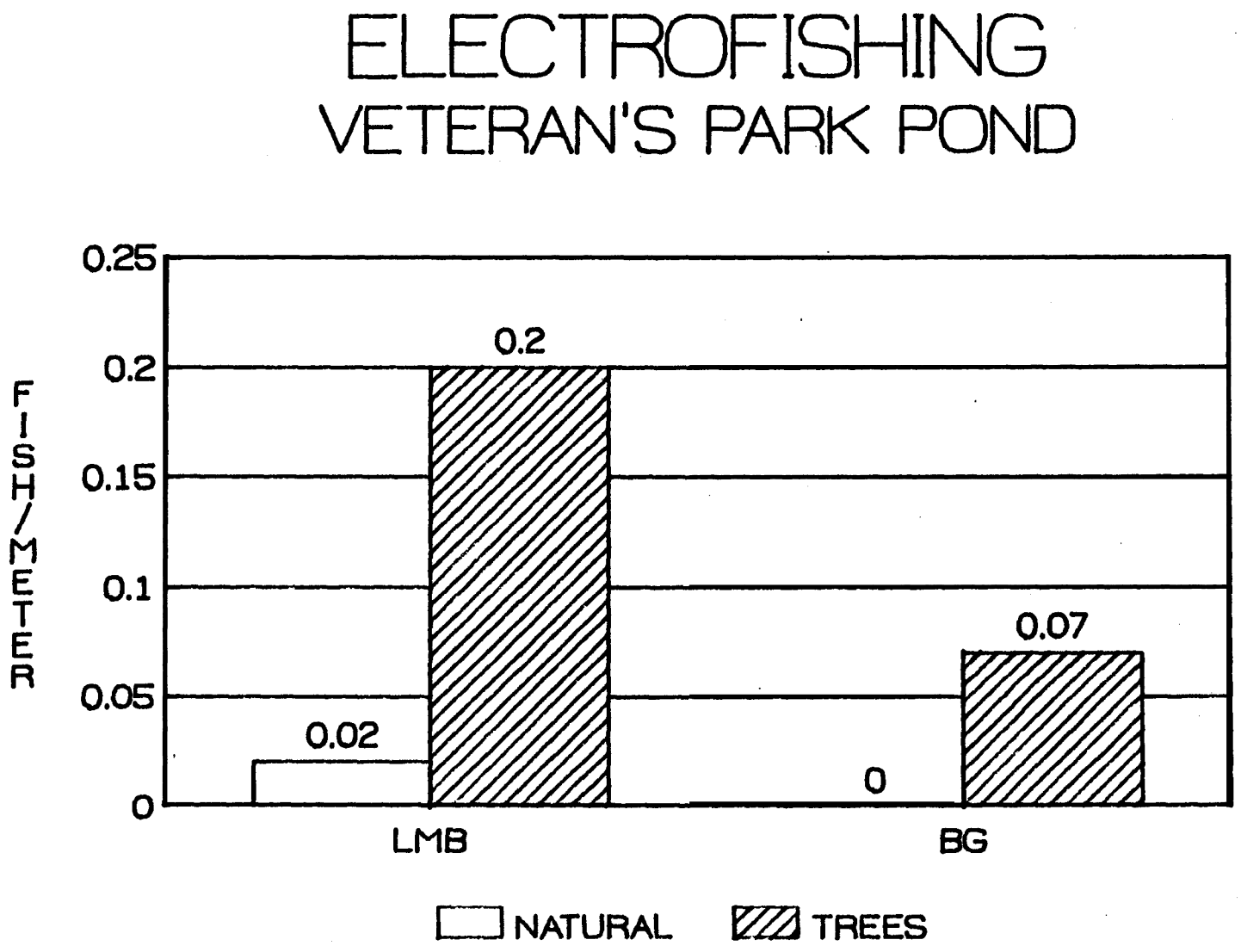
Figure 28. Densities of largemouth bass and bluegill sampled in structures and natural shorelines at C.J. Strike Reservoir, 21 September 1987.

Some problems occurred at C.J. Strike Reservoir when trees sank through the ice. Numerous trees were not secured adequately and were found floating in the reservoir. After review of the securing procedures, two changes will be made when constructing future structures. First, individual trees will be secured to the common weighted wire instead of securing the tires in bundles. Second, the securing wire will not be tightly attached from the tree to the common wire. Some movement of the tree must be allowed or wave action will break either the common wire or the wire from the tree to the common wire.

Christmas tree structures in Veterans Park Pond are providing habitat for juvenile black bass (Figure 29). Electrofishing the boundaries of the structures found densities of young-of-the-year bass in excess of 7 fish/m, compared to 0.1 bass/m along the natural shoreline.

Summary of Spot Creel Data

Spot creel checks conducted by Idaho Department of Fish and Game personnel provided enough data from 28 reservoirs, lakes, and ponds in Region 3 to report angler success (Tables 3 and 4). Anglers fished 21,270 hours and had 18,016 fish in possession for 0.85 fish per hour and 2.70 fish per angler. Hatchery rainbow trout were the most commonly found fish in the creel.



7/13/87

Figure 29. Densities of largemouth bass and bluegill sampled in tree structures and natural shorelines at Veterans Park Pond, 13 July 1987.

Table 3. Catch statistics for selected Region 3 lakes and reservoirs from spot creel checks, 1987.

Water	Anglers	Hours	Catch	Fish/hour	Fish/angler
Emmett Airport	10	16	4	0.25	0.40
Arrowrock Res.	345	1,019	632	0.62	1.83
Barton Res.	10	17	23	1.35	2.30
Trinity Lake	21	61	15	0.25	0.71
Black Canyon Res.	28	39	66	1.69	2.36
Brownlee Res.	497	2,108	1,761	0.84	3.54
Bull Trout Lake	11	34	23	0.68	2.09
C.J. Strike Res.	1,177	3,549	3,254	0.92	2.76
Caldwell Pond	79	119	149	1.25	1.89
Cove Arm	76	189	257	1.36	3.38
Crane Falls	345	1,041	1,297	1.25	3.76
Deadwood Res.	38	173	38	0.22	1.00
Dougal Pond	9	40	18	0.45	2.00
Duff Pond	11	18	15	0.83	1.36
Horseshoe Bend Pond	43	69	43	0.62	1.00
Indian Creek Res.	42	74	36	0.49	0.86
Lake Harbor	13	17	43	2.00	2.62
Lake Lowell	457	728	947	1.30	2.07
Little Camas Res.	4	18	15	0.83	3.75
Lucky Peak Res.	3,012	10,618	8,301	0.78	2.76
Manns Cr. Res.	43	85	91	1.07	2.12
Mtn. Home Res.	45	88	14	0.16	0.31
Paddock Res.	55	203	416	2.05	7.56
Riverside Pond	10	18	10	0.56	1.00
Sage Hen Res.	17	60	47	0.78	2.76
Swan Falls Res.	12	31	1	0.03	0.08
Tripod Res.	72	183	220	1.20	3.06
Veterans Park Pond	35	32	19	0.59	0.54
TOTAL	6,675	21,270	18,016	0.85	2.70

Table 4. Species composition (percent of catch) of selected Region 3 lakes and reservoirs as reflected by spot creel checks, 1987.

Water	N	WRB	HRB	KOK	LMB	SMB	CCAT	BH	CR	YP	BG	[S
Emmettt Airport	10	-	-	-	25	-	-	-	-	-	75	-
Arrowrock Res.	345	6	82	-	-	2	-	*	-	10	-	-
Barton Res.	10	-	-	-	-	-	-	-	30	-	-	-
Big Trinity Lake	21	-	100	-	-	-	-	-	-	-	-	-
Black Canyon Res.	28	-	6	-	-	-	-	52	-	42	-	-
Brownlee Res.	497	2	10	-	-	36	14	1	34	3	*	-
Bull Trout Lake	11	-	65	-	-	-	-	-	-	-	-	-
C.J. Strike Res.	1,177	11	12	-	4	37	1	1	7	21	6	*
Caldwell Pond	79	-	13	-	-	-	-	15	-	-	72	-
Cove Arm	76	1	24	-	-	1	-	1	-	72	2	-
Crane Falls	345	-	18	-	5	2	-	1	5	-	-	-
Deadwood Res.	38	35	13	38	-	-	-	-	-	-	-	-
Dougal Pond	9	100	-	-	-	-	-	-	-	-	-	-
Duff Pond	11	-	-	-	-	-	-	-	-	-	100	-
Horseshoe Bend	43	-	98	-	-	-	-	2	-	-	-	-
Indian Cr. Res.	42	-	17	-	-	-	-	-	3	-	81	-
Lake Harbor	13	-	-	-	3	-	-	35	24	-	35	-
Lake Lowell	457	-	2	-	4	*	*	5	3	26	43	3
Little Camas Res.	4	-	33	-	-	-	-	-	-	-	67	16
Lucky Peak Res.	3,012	*	97	*	-	*	*	-	-	2	-	-
Manns Cr. Res.	43	22	47	-	-	-	-	-	31	-	-	-
Mt. Home Res.	45	14	86	-	-	-	-	-	-	-	-	-
Paddock Res.	55	-	-	-	5	-	-	9	86	-	-	-
Riverside Pond	10	-	100	-	-	-	-	-	-	-	-	-
Sage Hen Res.	17	-	100	-	-	-	-	-	-	-	-	-
Swan Falls Res.	12	-	-	-	-	-	100	-	-	-	-	-
Tripod Res.	72	-	100	-	-	-	-	-	-	-	-	-
Vet. Park Pond	35	-	11	-	5	5	-	-	-	-	74	5
Total	6,696	3	55	1	2	11	2	1	8	8	9	2

*Indicates fish caught but a percent less than 0.5.
WRB = wild rainbow trout
HRB = hatchery rainbow trout
KOK = kokanee
LMB = largemouth bass
SMB = smallmouth bass
CCAT = channel catfish
BH = bullhead catfish
CR = crappie
YP = yellow perch
BG bluegill
PS = pumpkinseed

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JOB PERFORMANCE REPORT

State of: Idaho

Name: REGIONAL FISHERY MANAGEMENT INVESTIGATIONS

Project No.: F-71-R-12

Title: Region 3 (Boise) Rivers and Streams Investigations

Job No.: 3(GC)-c

Period Covered: July 1, 1987 to June 30, 1988

ABSTRACT

Densities of game fish in seven snorkeling transects in the Middle Fork Payette River decreased from 1986.

Low water and possibly the association of some of the transects to the 1986 Boiling Springs forest fire may account for the decreases. Transects in the South Fork Payette above Lowman had less wild rainbow than found in lower sections. Fish densities were lowest in sections directly adjacent to the highway, indicating angling pressure was effecting fish densities.

Sturgeon data collected in 1987 in the Snake River downstream from Swan Falls Dam indicate that the sturgeon population is recovering from the depressed state that it was in during the 1970s and early 1980s. Catch rates for large mature sturgeon were high, and very few mature fish were recaptured.

Authors:

Brent Mabbott
Regional Fishery Biologist

Terry Holubetz
Regional Fishery Manager

OBJECTIVE

1. To establish permanent transects and to enumerate fish densities in the Middle Fork and South Fork of the Payette River.

TECHNIQUES USED

Fish densities in the South and Middle Fork of the Payette River (Figure 1) were assessed by underwater counts. We recorded the water temperature, total length, and average width of each section and described the location of each section. When making underwater counts, we entered the water near the lower end of the transect, kept close to the shoreline, and looked to midstream to identify and enumerate the fishes. We counted 16 transects in 1987.

Fish densities were calculated using stream length in the South Fork and surface area in the Middle Fork. Both sides of the river were counted in the South Fork of the Payette River. In the Middle Fork, the surface area for each pool was measured using the average length and width. Fish densities for each section were calculated as **a** ratio of total numbers of fish to the sum of the surface area.

Regional fisheries management personnel and Department volunteers captured sturgeon with hook and line and marked the sturgeon with tatoos on the underside of the snout.

FINDINGS

Middle Fork Payette River

Wild trout densities in all transects (Figure 1) except one decreased in 1987 (Table 1). Upper transects saw slight decreases in surface areas sampled, but the wild trout densities decreased as much as 6.3 per 100 m. Whitefish densities remained constant except for increases in sections 2 and 6 of 6.8 and 10.1 whitefish per 100 m^2, respectively.

-The upper three sections are located adjacent to the area where the 1986 Boiling Springs fire occurred. Densities may have decreased as a direct result of the fire, or may be a combination of both the fire and low waters.

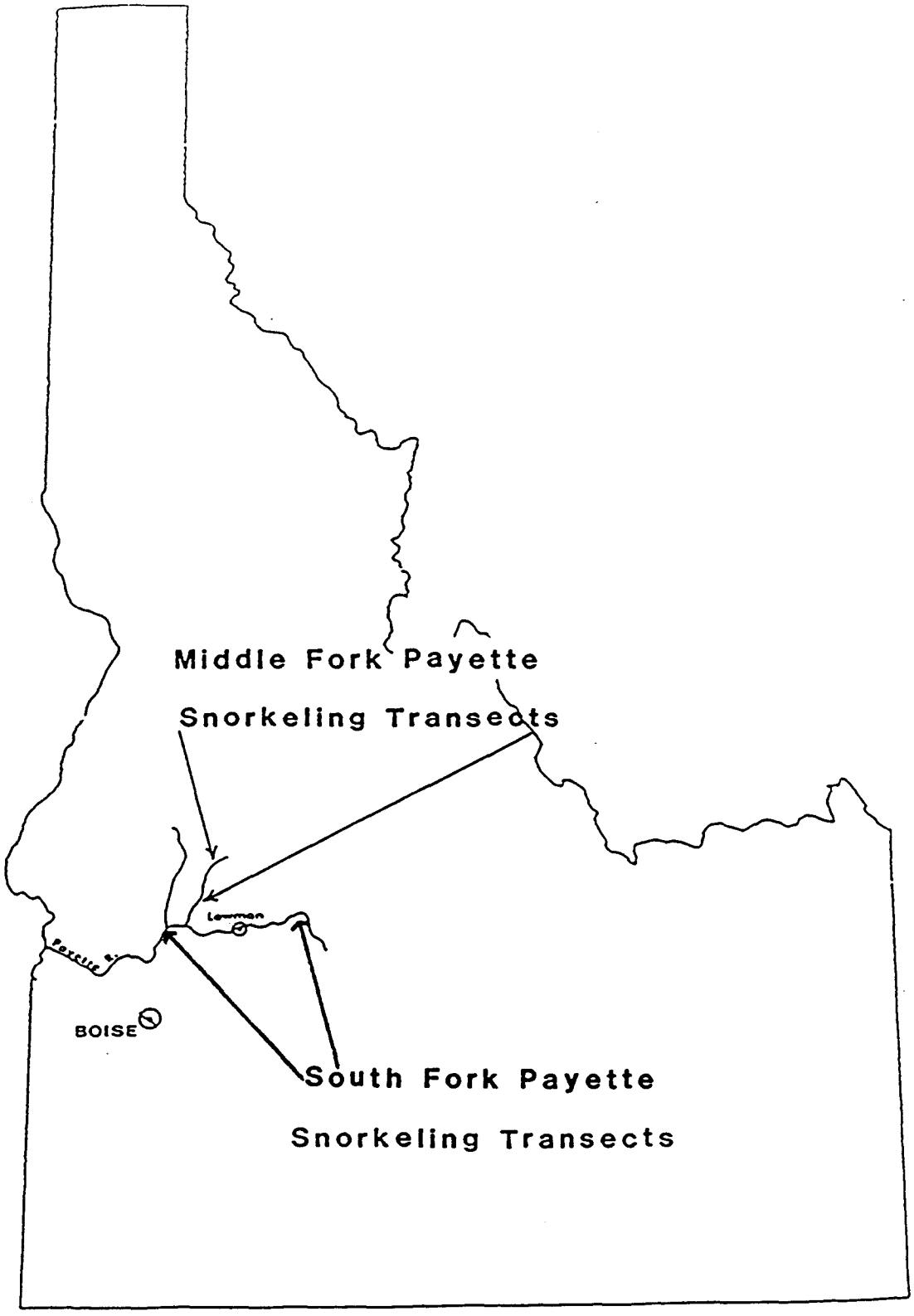

Figure 1. Location of snorkeling transects, Middle and South forks of the Payette River, 1987.

Table 1. Densities of fish (fish/100 m^2) in snorkeled sections of the Middle Fork of the Payette River, 1986 and 1987.

River	Sec.	Dates surveyed	Surface area (m^2)	Fish/100 m^2 Wild rainbow	Hatchery rainbow	Whitefish	Total fish
M. Fk. Payette R.	1	9/2/86	562.8	3.6	0.4	0.9	4.8
		8/24/87	400.0	0.0	0.0	0.0	0.0
	2	9/2/86	890.7	7.2	1.2	4.2	12.6
		8/24/87	819.1	0.9	1.0	11.0	12.8
	3	9/2/86	317.8	11.0	0.3	11.0	22.3
		8/24/87	309.6	0.6	0.3	10.0	11.0
	4	9/2/86	371.2	3.5	0.5	2.7	6.7
		8/24/87	353.8	5.1	1.7	1.4	8.2[a]
	5	9/4/86	298.1	2.0	0	11.4	13.4
		8/24/87	342.4	1.5	0	15.2	16.6
	6	9/4/86	827.9	0.5	0.6	18.0	19.1
		8/24/87	765.0	0.9	0.8	28.1	29.8
	7	9/4/86	678.6	0.0	0.0	3.4	3.4
		8/24/87	719.6	0.1	0.0	4.3	4.4

[a]Twelve salmonid fry observed.

South Fork Payette River

Wild trout densities were less than 10 fish per 100 m in sections (1 to 4) above Lowman (Table 2). Sections 5 to 9 downstream from Lowman had a mean of 55.5 wild trout per 100 m. Whitefish densities had a similar increase, with sections 1 to 4 having 102.5 whitefish/100 m and sections 5 to 9 having a mean of 173 whitefish/100 m. Physical stream and water characteristics did not visibly change until sections 7 to 9, where increasing amounts of suspended fine particles in the water reduced visibility and increased the difficulty of fish identification. The highway location next to the stream is the one factor that is evident in all the sections where fish densities are lowest (sections 1, 2, 3, 4, and 9).

Special regulations involving catch-and-release of wild fish may provide increased angling opportunity for the South Fork of the Payette River between Lowman and Grand Jean.

White Sturgeon

The relatively high catch per unit of effort (0.15) of white sturgeon and low recapture rate indicate that the population is much stronger than it was in the 1970s. The body condition of the sturgeon in this reach is very good and indicates that there is no shortage of food for these large fish.

Most of the sturgeon that have been captured, marked, and released were mature adults (Figure 2). The large hooks and type of gear used may be selective for the larger fish. An effort will be made in 1988 to determine the abundance of immature sturgeon with the use of additional smaller terminal gear and by sampling additional areas.

Comparisons of catch rates, fishermen reports, and length frequency data from the 1970s and early 1980s to the period 1984 through 1987 indicate that the status of the sturgeon population in the vicinity of Swan Falls Dam has improved in recent years. Catch rates in 1981 were less than 0.001. Catch rates for Department personnel in 1985 and 1987 were 0.11 and 0.15, respectively.

By the end of 1987, a total of 66 marked sturgeon had been released into the Snake River between Swan Falls and Givens Hot Springs. Only eight of these fish have been reported as recaptures by Department personnel and anglers. No multiple recaptures have been made. Unknown ingress and egress from the sampling area precludes making any population estimate, but the low recapture rate of 0.12 indicates that the population is large.

Table 2. Fish per 100 m in snorkeled sections of the South Fork Payette River, 1987.

Sec.[a]	Dates surveyed	Length	Fish/100 m Wild Rb	Brook trout	Ct	Hatch. Rb	White-fish	Total fish	Other
1	9/9/87	25.3	7.9	7.9		47.4	241	304	Sculpin
2	9/9/87	73.5	6.8				28.6	35.4	-
3	9/9/87	58.8	3.4	-			34.0	37.4	-
4	9/9/87	51.8	5.8		0.9	9.7	106.2	123.6	-
5	9/9/87	88.4	102.1			5.7	106.3	213.8	2 shiners
6	9/9/87	76.2	36.7				23.6	60.4	1 sculpin
7	9/9/87	52.7	94.9				334.0	428.8	28 sucker
8	9/9/87	55.2	25.4				150.4	175.7	31 sucker 1 squawf.
9	9/9/87	96.9	18.6				38.2	56.8	3 suckers

[a]Sections 1 to 4 (Grand Jean to Lowman), sections 5 to 8 (Lowman to Garden Valley), and Section 9 (between Garden Valley and Banks).

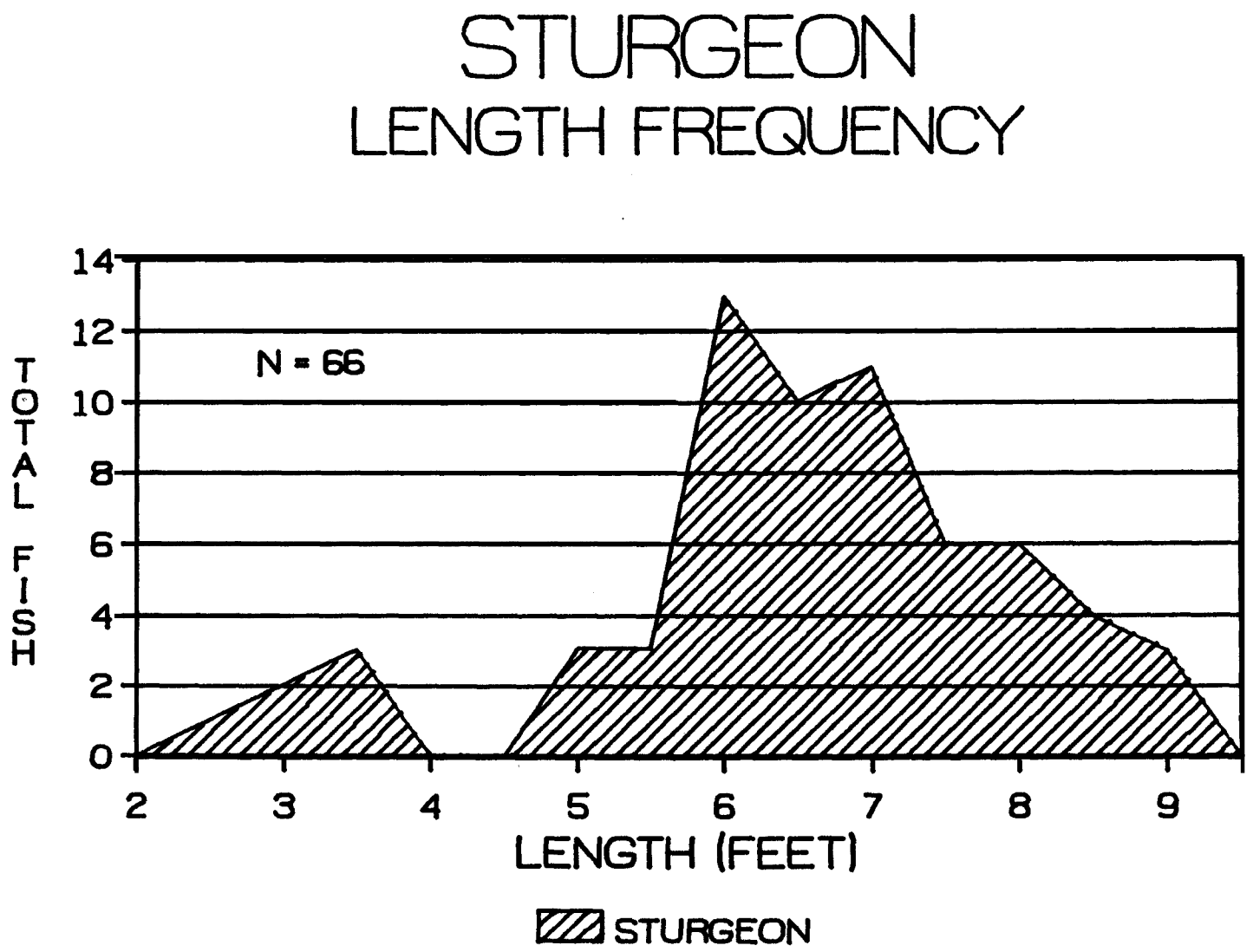

Figure 2. Length frequency of sturgeon captured, marked, and released in the Snake River downstream from Swan Falls Dam in 1986 and 1987.

SUMMARY OF SPOT CREEL DATA

Spot creel checks conducted by Idaho Department of Fish and Game personnel reveal enough data from 41 rivers and streams in Region 3 to report (Tables 3 and 4). The 3,412 anglers interviewed had a mean success rate of 0.6 fish per hour and 1.34 fish in possession. Hatchery rainbow trout comprised 36% of the fish in the creel, with wild rainbow comprising 25% of the catch.

Table 3. Catch statistics for selected Region 3 streams and rivers from spot creel checks, 1987.

Water	Anglers	Hours	Catch	Fish/ hour	Fish/ angler
Alder Creek	8	17	13	0.76	1.63
Beaver Creek	14	52	50	0.96	3.57
Boise River	339	552	144	0.26	0.42
Clear Creek	41	104	84	0.81	2.05
Crooked River	30	80	31	0.39	1.03
Deadwood River	25	55	40	0.73	1.60
Grimes Creek	76	129	104	0.81	1.37
Harris Creek	35	65	59	0.91	1.69
Jordan Creek	28	53	87	1.64	3.11
Long Tom Creek	5	16	26	1.63	5.20
Lowline Canal	6	16	19	1.19	3.17
Middle Fork Boise River	194	658	345	0.52	1.78
Middle Fork Payette River	140	290	271	0.93	1.94
Macks Creek	11	40	29	0.73	2.64
Mammoth Creek	8	18	38	2.11	4.75
Mores Creek	61	137	68	0.50	1.11
North Fork Boise River	95	228	176	0.77	1.85
North Fork Payette River	34	64	49	0.77	1.85
Payette River	157	317	197	0.62	1.25
Pickett Creek	2	6	12	2.00	6.00
Pine Creek	14	25	23	0.92	1.64
Queens River	8	17	7	0.41	0.88
Rabbit Creek	6	29	31	1.07	5.17
Rattlesnake Creek	4	13	13	1.00	3.25
Reynolds Creek	15	34	56	1.65	3.73
Robie Creek	8	17	12	0.71	1.50
South Fork Boise River	32	148	172	1.16	5.38
South Fork Payette River	490	825	763	0.92	1.56
Silver Creek	16	64	29	0.45	1.81
Sinker Creek	3	12	23	1.92	7.67
Smith Creek	5	10	23	2.30	4.60
Snake River	1,318	3,328	1,344	0.40	1.02
Wilson Drain	121	155	123	0.79	1.02
Total	3,412	7,682	4,574	0.60	1.34

Table 4. Species composition (percent of catch) of selected Region 3 streams and rivers as reflected by spot creel checks, 1987.

Water	N	WRB	HRB	BU	BT	CT	BR	WF	LMB	SMB	CCAT	CR	YP	BG
Alder Creek	8	46	54	-	-	-	-	-	-	-	-	-	-	-
Beaver Creek	14	16	76	-	8	-	-	-	-	-		-	-	-
Boise River	339	1	81	-	-	-	1-	6	-	1	9-	1	-	-
Clear Creek	41	57	43	-	-	-	-	-	-	-	-	-	-	-
Crooked River	30	23	58	13	13	-	-	-	-	-	-	-	-	-
Deadwood River	25	88	10	-	-	2	-	-	-	-	-	-	-	-
Grimes Creek	76	18	57	22	22	-	-	-	-	-	-	-	-	-
Harris Creek	35	98	2	-	-	-	-	-	-	-	-	-	-	-
Jordan Creek	28	17	83	-	-	-	-	-	-	-	-	-	-	-
Long Tom Creek	5	100	-	-	-	-	-	-	-	-	-	-	-	-
Lowline Canal	6	-	5	-	-	-	-	-	-	-	-	-	63	16
M. Fk. Boise R.	194	14	77	2	-	-	-	6	-	-	-	1	-	-
M. Fk. Payette R.	140	52	45	1	-	-	-	2	-	-	-	-	-	-
Macks Creek	11	83	3	-	-	-	-	-	-	-	3	-	10	-
Mammoth Creek	8	100	-	-	-	-	-	-	-	-	-	-	-	-
Mores Creek	61	26	74	-	-	-	-	-	-	-	-	-	-	-
N. Fk. Boise R.	95	27	68	5	0.5	-	-	0.5	-	-	-	-	-	-
N. Fk. Payette R.	34	27	73	-	-	-	-	2	-	-	-	-	-	-
Payette River	157	6	60	-	-	-	-	21	-	3	-	-	-	9
Pickett Creek	2	100	-	-	-	-	-	-	-	-	-	-	-	-
Pine Creek	14	26	74	-	-	-	-	-	-	-	-	-	-	-
Queens River	8	29	43	14	-	-	-	14	-	-	-	-	-	-
Rabbit Creek	6	65	35	-	-	-	-	-	-	-	-	-	-	-
Rattlesnake Creek	4	23	69	-	-	-	-	-	-	-	-	-	-	-
Reynolds Creek	15	100	-	-	-	-	-	-	-	-	-	-	-	-
Robie Creek	8	33	67	-	-	-	-	-	-	-	-	-	-	-
S. Fk. Boise	32	96	2	-	-	-	-	0.5	-	-	-	-	-	-
S. Fk. Payette R.	490	32	39	*	*	-	-	28	-	-	-	-	-	-
Silver Creek	16	-	100	-	-	-	-	-	-	-	-	-	-	-
Sinker Creek	3	100	-	-	-	-	-	-	-	-	-	-	-	-
Smith Creek	5	30	-	-	70	-	-	-	-	-	-	-	-	-
Snake River	1,318	1	3	-	-	-	-	-	18	42	22	3	-	-
Wilson Drain	121	20	50	-	-	-	29	-	-	-	-	-	6	3
													-	-
TOTAL	3,412	25	36	*	1	*	1	6	*	6	13	1	2	1

WRB = wild rainbow trout
HRB = hatchery rainbow trout
KOK = kokanee
LMB = largemouth bass
SMB = smallmouth bass
CCAT = channel catfish
BH = bullhead catfish
CR = crappie
YP = yellow perch
BG = bluegill
PS = pumpkinseed

JOB PERFORMANCE REPORT

State of: Idaho **Name:** REGIONAL FISHERY MANAGEMENT INVESTIGATIONS

Project No.: F-71-R-12 **Title:** Region 3 (Boise) Technical Assistance

Job No.: 3 (GC)-d

Period Covered: July 1, 1987 to June 30, 1988

ABSTRACT

Review of approximately 300 federal, state, county, city, and private proposals for land and water resource development comprised a very heavy workload in 1987. Stream alteration permit review on the Boise and Payette rivers were the most time-consuming activities. Both of these rivers flow through highly developed agricultural and municipal areas and are subjected to repeated temporary channel and streambank alterations. The fish and wildlife habitat of these streams is sustaining heavy damages annually.

Authors:

Brent Mabbott
Regional Fishery Biologist

Terry Holubetz
Regional Fishery Manager

OBJECTIVES

To achieve protection, mitigation, and enhancement of fish and wildlife habitat in the review of proposals to develop or alter land and water resources.

TECHNIQUES USED

All land and water development or alteration projects are inspected and reviewed, and comments are provided to the proposer and regulatory agencies.

FINDINGS

Formal and informal comments were made on approximately 300 federal, state, county, city, and private proposals for land water resaource development. Many of our comments that are designed to protect fish and wildlife habitat are not being effected in the most common procedure, the State's stream alteration permit system. Often, our concerns are addressed in the permits; but because the Water Resource Department does not have adequate staffing to provide field administration of the permits, project implementation deviates from permit conditions, and excessive damages to fish and wildlife habitat occur.

Generally, our comments carry considerable weight with the regulatory agencies; and our input to these processes is extremely important, although it consumes enormous amounts of time in this region. With the exception of the stream alteration permit process, our input is normally effective in the protection or enhancement of the fish and wildlife resources.

An effort will be made to work through state and local governments to establish a stream corridor management program for both the lower Boise and lower Payette rivers that will mandate long-term solutions that provide better riparian and aquatic habitats.

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Submitted by:

Brent Mabbott
Regional Fishery Biologist

Terry Holubetz
Regional Fishery Manager

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

Jerry M. Conley, Director

Steven M. Huffaker, Chief
Bureau of Fisheries

Al Van Vooren
Resident Fisheries Manager